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ABSTRACT

With funds from the International Business Machines (IBM) Corporation, Project SYNERGY was launched in January 1990 to address the problem of students deficient in basic skills entering colleges. Project SYNERGY I focused on reviewing and compiling a list of useful instructional software for basic skills remediation; Project SYNERGY II focused on software implementation; and Project SYNERGY III developed an integrated, adaptive, computerized management system. Twenty-two institutions in the United States and Canada, led by Florida's Miami-Dade Community College (MDCC), participated in reviewing and implementing computer software for community college students. The first section of this third year progress report summarizes the software review process results, including reviews of 259 different software packages. This section contains 35 tables providing ratings of individual software programs for reading, writing, mathematics, English as a Second Language (ESL), study skills and critical thinking, and multimedia packages. Part 2 provides information on 13 research studies conducted, explaining trends emerging from the studies. Part 3 discusses the implementation of the Project SYNERGY Integrator, a software management system to ensure software standards and track student progress through different programs. Part 4 describes the local area network (LAN) that comprises the Project's environment, focusing on the physical, social, and cultural conditions of the LAN. The final section presents an overview of the state of technology in education and future plans for the project. Appendixes include a cumulative directory of project participants, list of software attributes and learning objectives and software publishers, and applications software and hardware configurations. (TGI)

ED 392 487

Project SYNERGY

Software Support for Underprepared Students

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Year Three Report

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JC 960 150

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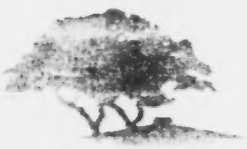

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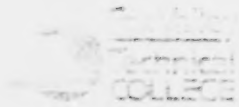
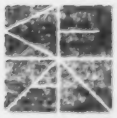
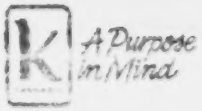
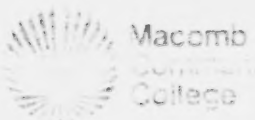






A Purpose in Mind

Lane Community College



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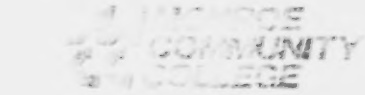
College



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SINCLAIR
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Project SYNERGY

Software Support for Underprepared Students

Year Three Report

September 1993

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FOREWORD

In 1987, the League for Innovation in the Community College decided to undertake a joint venture to address a serious national issue — basic skills deficiencies among a majority of the students seeking college education. The problem continues to worsen as increased numbers of jobs require post high school education. Today, the greatest threat to our nation's well being is the growing underclass of individuals in our society whose skills do not match those needed to be productive members of the workforce; instead, they become dependent on the society, depleting its resources and robbing its opportunities to develop a superior workforce for the twentieth century.

Against this national backdrop, Project SYNERGY is being developed with great promise for effectively addressing the problem. Project SYNERGY has had the grassroots involvement of well over 300 faculty and staff from 22 institutions across the nation and their sustained commitment to carry out their respective responsibilities in order for the project to move forward. Beginning with reviewing existing instructional software, the project is now poised to present a holistic and integrated approach for addressing the basic skills deficiencies among college students. I am particularly excited about the potential of Project SYNERGY Integrator to make a breakthrough in integrating teaching and technology in meaningful and enduring ways and to develop innovative economic models for making technology affordable at an operational level.

Miami-Dade is honored to have the opportunity to lead this collaborative effort, which has received a financial boost through two IBM hardware grants worth $2.6 million and a Federal Higher Education Act Title III grant for $2.3 million. We have made some important strides toward addressing a problem that threatens the very future of our society. I wish all the participating institutions continued success. We plan to support and promote your accomplishments and persuade national, state, and educational leaders to support your efforts.

Robert H. McCabe
President, Miami-Dade Community College, District

Acknowledgments

We gratefully acknowledge the contributions of individuals and institutions to Project SYNERGY. In particular...

The International Business Machines (IBM) Corporation for its awards for Project SYNERGY I and II.

The U.S. Department of Education (Title III) for its award for Project SYNERGY III.

The League for Innovation in the Community College for nurturing inter-institutional collaboration.

The publishers who have provided their software for review.

The publishers who have signed the agreement to make their software compatible with Project SYNERGY Integrator.

The College Board for providing its Computerized Placement Tests (CPT's) for pre- and post-testing in the software implementation studies and its diagnostic test GUIDES for pilot testing.

The staff of ISAAC for establishing an electronic database for Project SYNERGY reviews.

The faculty reviewers, question writers, and administrators of participating institutions and of the five campuses of Miami-Dade Community College.

M-DCC North Campus and Wolfson Campus administrators and faculty and those at Bakersfield College for their support and participation in the software implementation studies.

The Educational Development Laboratory (EDL) publisher for making available its software for evaluation at Wolfson Campus and Bakersfield College.

Andy Martin and his staff at M-DCC's Media Academic Support for the services they provided to produce two videotapes on Project SYNERGY.

The Project SYNERGY Integrator Design Team for its sustained effort.

The staff of Educational Technologies at M-DCC for their team effort to make it all happen — particularly, Lorne Kotler for producing this *Year Three Report*.

Dr. Robert H. McCabe, College President, for his vision and mission in addressing the problem of basic skills deficiencies among college students.

Miami-Dade Community College's Board of Trustees for its commitment to and support of the college's philosophy to provide a second and third chance to the students in the community.

Jon Alexiou, Chair
Project Steering Committee

Kamala Anandam
Project Director

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Introduction

Kamala Anandam
Project SYNERGY Director
Miami-Dade Community College

In 1987, the Board of Directors of the League for Innovation in the Community College reached a unanimous decision that the League member institutions should collectively address the national issue of underprepared college students. Dr. Robert H. McCabe, President of Miami-Dade Community College, offered to lead the effort. The following two years witnessed a number of dialogues and discussions that culminated in a week-long meeting in Miami in February 1989. Approximately sixty faculty and administrators from seventeen League and two non-League colleges participated in the meeting and arrived at a focus and direction for our effort.

In January, 1990, Project SYNERGY was launched, and we are pleased to publish this *Year Three Report*. Occasionally, a project comes along which is the right project at the right time for the right reason with the right players having at least some of the right answers. Project SYNERGY is such a project, addressing the basic-skills deficiencies among individuals seeking college education. Project SYNERGY represents a determined and concerted effort of nineteen two-year colleges and three four-year colleges coordinated by Miami-Dade Community College under the auspices of the League for Innovation in the Community College. Project SYNERGY I (January 1990 - December 1991), supported by a $1.3-million grant from IBM, focused on reviewing and compiling a list of useful instructional software for basic skills remediation; Project SYNERGY II (January 1992 - June 1994), also supported by IBM with another $1.3-million grant, continues software review and focuses on software implementation and research; Project SYNERGY III (October 1992 - September 1997) is a $2.3-million Title III grant to Miami-Dade Community College to develop an integrated, adaptive, computerized management system that will help institutions take a holistic approach in establishing *Learning Environment 2000 for Underprepared College Students*.

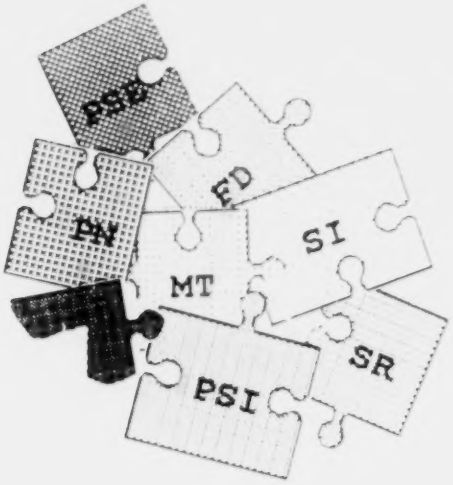
Looking back at the origins and progress of Project SYNERGY, I realize that its success is mostly attributed to three phenomena:

- grassroots involvement of faculty who teach underprepared college students.
- working at one thing at a time as if the project were a jigsaw puzzle.
- seizing the windows of opportunity along the way.

The degree of grassroots involvement will become apparent to the reader in Appendix A, which presents a roster of the 429 faculty, staff, and administrators who have participated in the various SYNERGY activities. Some have participated in more activities than others and some have participated for a longer time than others. The collective wisdom emerging from collaborative effort will undoubtedly leave its mark in solving the national crisis of basic-skills deficiencies among college students.

As we began with Project SYNERGY I, we were aware of one piece in the puzzle: that was the software-review process. Since then, we have identified seven more pieces. Putting the puzzle together thus far has been quite challenging, and as each piece falls in its place, the emerging picture has given us a great sense of accomplishment. The picture is not complete by any means; however, if you are curious to know what we are aiming for as the bigger picture, you will find it on page 99.

The SR piece is the software review process described in Part One. As of June 1993, 102 faculty across the nation had completed 404 reviews of 259 software packages in reading, writing, math, ESL, and study skills/critical thinking. The review results are available to readers in this report, as well as through PS3, a computerized database (see page 39) and through an electronic database called IKE (see page 5).



Closely corresponding to the objectives in the software review process is the **MT** piece representing the activity through which faculty from SYNERGY colleges, with the assistance of a computerized tracking system, are writing questions to correspond to the SYNERGY objectives in reading, writing, and math. Three Miami-Dade faculty — Norma Agras, Don Meagher, and Melinda Prague — are coordinating the effort that will result in a computerized bank of questions to support mastery testing. The **MT** piece is described in Part One.

The **SI** and **R** pieces go together in many ways and are described in Part Two. As of June 1993, 25 faculty in 4 institutions had been involved in these activities; they are at different stages in the implementation process. While they have used or will be using different software, research will be the common thread that will run across all institutions. This common thread consists of an *internal frame of reference* for faculty to engage in research to determine the *most effective combination of human and technological resources* that will yield the greatest benefit to **each** student. In our approach to software implementation, research is presented as an instrument of change and not as a litmus test of good or bad teaching. Besides the SYNERGY reports, a half-hour videotape on our *Software Implementation Model* is available to readers.

The **PSI** and **PN** pieces go together also and are presented in Part Three. PSI (Project SYNERGY Integrator) is an adaptive management system for Local Area Networks. It incorporates Project SYNERGY *learning objectives* and *mastery test questions* and provides *installation options* to include *multi-vendor software* for testing and instruction. It provides *linkages* among learning objectives, instructional software, and mastery tests in order for the student to have smooth transitions from one learning objective to another and from one software package to another. It is designed to assist faculty to have a more efficient handle on *how their students are progressing* and *take appropriate action* in a multi-vendor software environment. Over *400 faculty and administrators* at two- and four-year institutions have been involved in specifying the necessary features and functions for PSI. Miami-Dade plans to establish *an installed base of 66 PSI institutions in the first year after its announcement* in order to create a momentum for adoption of PSI by other institutions. The plan includes the following:

- Six **PSI Training Centers** (four existing Project SYNERGY Centers for Software Implementation plus two new ones).
- Ten **PSI Pioneer Colleges** through a Title III consortium grant.
- Fifty **PSI Early Adopter Colleges,** selected on the basis of an RFP or by invitation.

PSI is designed to provide, on the one hand, a system that has standard faculty and student interfaces and, on the other, a platform of neutrality to accommodate multi-vendor

software without affecting the standard user interfaces.

Our work with faculty and administrators in implementating software and conducting research has drawn attention to many other factors that facilitate or debilitate the use of technology on a campus. We have coined the expression *Project SYNERGY Environment* (**PSE** piece) to represent these factors, which are described in Part Four. Environment embraces *physical, social,* and *cultural aspects* that an institution should endeavor to provide in order to maximize the benefits of PSI. Physical aspects include *space, hardware, software, location, security,* and *safety;* social aspects deal with *personnel and the interrelationships among them;* cultural aspects expect the institutions to *examine their traditional practices* (budget allocation, class size, number of contact hours, beginning and end of terms) and modify them in order to enhance the efficiency and effectiveness of PSI. An institution's success in addressing these aspects is enhanced by *planned communication* (memos, reports, meetings, phonemail, E-mail) to keep all the participants well informed of the operations and outcomes of the SYNERGY Center and in encouraging them to stay involved and make it an even better place.

A major activity embedded in the PSE piece but deserving special attention is the FD (Faculty Development) piece. It is discussed in Part Four as well. A half-hour videotape on *Faculty Role in Integrating Teaching and Technology* is available.

Enjoy your reading.

Part One: Software Reviews

Lorne Kotler
Faculty Participation Coodinator
Miami-Dade Community College

In Project SYNERGY II, we have expanded the software review process beyond reading, writing, and mathematics to include ESL and study skills/critical thinking, as well as multimedia packages in all the disciplines. In the original three subject areas, our goal has been to raise the number of reviews per package to three for those titles that have been reviewed already; this goal has not, however, precluded our adding new titles. During last fall and so far in 1993, the review of software in ESL and study skills/critical thinking has gone into full swing. Across the twenty-two Project SYNERGY II institutions, there are about fifty active faculty reviewers, some of them "veterans" from Project SYNERGY I.

As some readers are already aware, the process of reviewing instructional software in Project SYNERGY has been highly systematic, with an emphasis on locating packages that are currently implemented in an educational setting. After the faculty identify software programs, they reserve the titles with the Project's Software Reviews Coordinator, thereby insuring that a package receive no more than three reviews. Faculty are responsible for securing the software, which publishers as a whole have been very cooperative in providing for review on a complimentary basis; then faculty request the project team to prepare and send a review disk specially created for each package.

Each software review collects information about hardware requirements, learning objectives covered satisfactorily, instructional modes, and operational reliability and format; it also provides plenty of room for open-ended commentary and insights. While the emphasis in this process has been on the judgments of faculty as "content experts," student input has been encouraged whenever possible. For the software that becomes compatible with Project SYNERGY Integrator (PSI), we will be able to collect effectiveness data showing PSI users which lessons are working in which ways with which students and showing publishers areas where modifications would be appropriate.

The instructional software is evaluated according to criteria established by faculty teaching underprepared students. These criteria (learning objectives unique to each discipline and software attributes common to all disciplines) were evolved through several iterations starting in February 1989 at the "Workshop on Computer-Based Instructional Support for the Underprepared Student" (Miami, FL). A complete list of Software Content Attributes, Reading Objectives, Writing Objectives, Mathematics Objectives, ESL Objectives, and Study Skills/Critical Thinking Objectives is shown in Appendix B.

To manage the review process, the project team established and has maintained a special computerized database to keep track of the software packages reserved, the reviewers involved, and the status of the reviews underway. When the Software Reviews Coordinator receives a completed review disk,

it is checked for consistency and synthesized for inclusion in the Project SYNERGY database called PS[3] (see page 39) and for posting on IKE (IBM Kiosk for Education), an electronic bulletin board and database devoted to information about the use of IBM-compatible hardware and software as aids to instruction and research at the higher-education level.

Getting on IKE

Developed and operated by the University of Washington and supported by IBM, IKE is accessible via modem (toll number), via the Internet computer network (free if you have an account on a computer connected to this network), or via Gopher. For further information, you may call the ISAAC office at (206) 543-5604, between 8:00 AM and 4:30 PM, Pacific Time, or via electronic mail at *ike@ike.engr.washington.edu*, or write to ISAAC Access, m/s FC-06, University of Washington, Seattle, WA 98195.

If you have access to IKE and would like to see the project's software reviews, choose **DATABASES** at the main menu. Then choose **Software Reviews (Project SYNERGY)** to enter the database of reviews; at this point, type in one or more search words (e.g., discipline words, key words from objectives, title words). From a list of software titles that will be displayed following the search, you may view the review(s).

Progress

As of June 1993, there were a total of 404 reviews of 259 software packages in Project SYNERGY. Starting on the next page are syntheses of the reading, writing, mathematics, ESL, and study skills/critical thinking reviews posted on ISAAC. These are not all claimed to be *ideal* packages, merely ones that seem to have some useful applications and some satisfactorily implemented learning objectives and software attributes.

The tables highlight the coverage of objectives and attributes implemented satisfactorily as a percent of the total possible in each subcategory. The tables also present reading level (for reading and writing), number of reviews, and instructional modes implemented. A list of software publishers' names and addresses is given in Appendix C.

It should be noted that where there are fewer than three reviews, the numbers could change as additional reviews are received. Also, the faculty's open-ended comments about the uniqueness of the program, their level of enthusiasm about it, and their judgment of its appropriateness for adults and underprepared students are not quantified in these tables.

A final word: as we have noted before, a significant and integral feature of the software review process has been the highly positive responses of the faculty doing the grassroots work. They believe that reviewing instructional software for Project SYNERGY has constituted a central activity of their professional development for several reasons: they have learned to evaluate software more critically and systematically; they understand better how to use software with their students; and their stature within their institution as developmental educators has been enhanced. As one project participant put it: "Some of our faculty who weren't doing much with technology are now talking up the software-review process. They're not happy with the early drill-and-practice. This project has moved faculty to want to do more. It has not only raised their awareness; it has whet their appetites too."

Synthesis of Project SYNERGY Reviews for Reading

SOFTWARE ID	R001	R002	R003	R004	R005	F.007	R009	R011
Reading Level (Grade Level)	10-13+	9-13+	7-8	7-8	7-8	4-12	10-13+	7-13+
# of Reviews (up to 3)	3	3	2	3	2	1	1	1
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	Y	–	Y	Y	Y	Y	Y	Y
Tutorial	Y	Y	Y	Y	Y	N	N	–
Simulation	–	–	–	–	–	N	–	–
Game	Y	–	Y	–	–	Y	–	N
Comprehensive Tool	Y	–	–	–	–	N	–	–
Partial Tool	–	–	–	–	–	Y	Y	Y
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Word Learning Skills (46)	11	0	22	0	0	15	20	11
Functional Reading (10)	0	0	0	0	0	0	0	0
Basic Comprehension (15)	73	13	0	53	33	0	0	0
Transitional Expressions (9)	0	0	0	0	0	0	0	0
Critical Comprehension (29)	0	0	0	14	28	0	69	0
Textbook / Technical Reading (18)	0	0	0	11	44	0	0	0
Reading in Content Areas (29)	0	0	0	0	14	0	0	0
Rate & Flexibility (11)	18	0	0	0	0	0	0	0
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	100	100	100	100	67	100
Appropriateness (5)	100	100	100	80	100	80	80	80
Feedback (3)	100	100	100	33	100	100	67	0
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	100	33	100	100	100	100	67	33
Adaptability (6)	100	50	100	100	100	100	17	83
Summary Information (6)	67	33	67	83	67	67	83	83
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease of Use (7)	43	43	43	43	43	57	14	43
Adaptability (4)	75	25	75	50	75	75	0	75
Testing (3)	67	0	67	0	0	67	33	0
Tracking (2)	50	0	100	100	50	100	0	50
Interactivity (7)	100	86	100	100	100	86	57	57
Appropriateness (18)	11	11	89	39	56	56	11	33
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliability (3)	100	100	100	100	100	67	67	100
Format (7)	43	43	43	43	43	29	29	29

The publisher is shown in parentheses in the list below:

R001 *Speed and Strategy Reading Efficiency System* (Weaver Instructional Systems)
R002 *Critical Thinking I* (Compris)
R003 *Vocabulary Level IV* (IBM)
R004 *Reading for Meaning Level IV* (IBM)
R005 *Reading for Information Level IV* (IBM)
R007 *Word Attack Levels 1-9* (Davidson & Associates)
R009 *Lessons in Reading and Reasoning I* (Queue, Inc.)
R011 *Spell It* (Davidson & Associates)

Table 1.1

Synthesis of Project SYNERGY Reviews for Reading

SOFTWARE ID	R012	R013	R014	R016	R017	R018	R021	R022
Reading Level (Grade Level)	9-13+	5-13+	1-6	7-12	6-13	3-4	9-13+	9-12
# of Reviews (up to 3)	3	3	2	3	1	1	2	3
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	–	–	Y	Y	Y	Y	Y	Y
Tutorial	Y	–	Y	Y	Y	Y	Y	Y
Simulation	–	X	–	–			Y	
Game	–	Y	Y					
Comprehensive Tool	–	–	–	–	Y			
Partial Tool	–	–	–	Y				
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Word Learning Skills (46)	0	0	9	11	24	54	0	20
Functional Reading (10)	0	10	0	0	0	10	0	0
Basic Comprehension (15)	100	0	33	53	67	33	20	0
Transitional Expressions (9)	0	0	0	67	11	0	0	0
Critical Comprehension (29)	34	14	10	0	62	17	7	0
Textbook/Technical Reading (18)	22	39	0	0	61	28	0	0
Reading in Content Areas (29)	7	10	0	0	41	0	0	0
Rate & Flexibility (11)	0	18	45	0	36	0	64	0
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	100	100	100	100	100	67
Appropriateness (5)	100	100	80	100	100	100	100	100
Feedback (3)	33	100	100	33	100	100	100	100
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	100	83	100	50	100	100	100	100
Adaptability (6)	83	67	100	67	100	100	67	67
Summary Information (6)	83	33	83	67	67	67	17	50
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease of Use (7)	71	29	100	29	43	57	100	29
Adaptability (4)	50	100	75	0	100	75	100	25
Testing (3)	0	0	33	0	100	67	67	0
Tracking (2)	50	100	100	100	100	50	100	50
Interactivity (7)	29	100	86	57	100	100	100	71
Appropriateness (18)	11	61	56	33	44	22	67	33
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliability (3)	100	100	100	67	100	100	100	100
Format (7)	29	43	43	29	43	43	57	43

The publisher is shown in parentheses in the list below:

R012 *SEEN* (Conduit)

R013 *Oregon Trail* (MECC)

R014 *CORE Reading and Vocabulary Development* (Educational Activities, Inc.)

R016 *Ten Steps to Improving Reading Skills* (Townsend Press)

R017 *Reading V: GED Objectives* (Iostens Learning)

R018 *BLS Tutorsystems, Adult Education Reading 100* (BLS)

R021 *SpeedReading: The Computer Course* (Bureau of Business Practices)

R022 *Analogies I* (Queue, Inc.)

Synthesis of Project SYNERGY Reviews for Reading

SOFTWARE ID	R023	R024	R025	R026	R027	R028	R030	R031
Reading Level (Grade Level)	5-6	6-13+	10-12	8-9.5	5-6.5	5-6	3-12	8-12
# of Reviews (up to 3)	2	2	2	2	2	2	2	3
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	Y	Y	Y	Y	Y	Y	Y	Y
Tutorial	X	Y		X	X	Y	X	X
Simulation	Y			Y	Y	Y	Y	
Game						Y		
Comprehensive Tool				Y	Y		Y	
Partial Tool			Y		Y			
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Word Learning Skills (46)	0	13	15	11	15	28	50	20
Functional Reading (10)	10	0	0	0	0	0	0	0
Basic Comprehension (15)	87	27	60	100	100	0	100	47
Transitional Expressions (9)	11	0	56	89	100	0	100	0
Critical Comprehension (29)	31	0	31	79	41	0	76	7
Textbook / Technical Reading (18)	44	0	17	11	11	0	0	0
Reading in Content Areas (29)	17	0	10	14	14	0	28	0
Rate & Flexibility (11)	0	0	0	64	64	0	0	0
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	67	100	100	100	100	100	100
Appropriateness (5)	100	80	100	100	80	100	100	80
Feedback (3)	100	100	100	33	33	100	100	100
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	100	83	83	100	100	100	100	100
Adaptability (6)	100	100	67	100	100	100	100	100
Summary Information (6)	83	83	83	100	83	67	100	83
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease of Use (7)	57	57	43	100	100	43	57	29
Adaptability (4)	50	75	25	100	75	75	100	100
Testing (3)	33	67	0	100	33	100	67	0
Tracking (2)	100	100	100	100	100	100	100	50
Interactivity (7)	100	86	71	71	71	100	100	86
Appropriateness (18)	56	22	33	11	11	83	11	11
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliability (3)	100	100	100	100	100	100	100	100
Format (7)	43	43	29	43	29	43	29	29

The publisher is shown in parentheses in the list below:

R023 *Reading for Information: Level III* (Jostens Learning)

R024 *Reading Efficiency System* (Weaver)

R025 *College Aptitude Reading Comprehension* (Queue, Inc.)

R026 *Learning 100: Reading Strategies (HA 1-20)* (EDL)

R027 *Learning 100: Reading Strategies (EA 1-20)* (EDL)

R028 *Spelling: Level III* (Jostens Learning)

R030 *ADD: Adjusting Degrees of Difficulty Series 1* (Queue, Inc.)

R031 *ADD: Adjusting Degrees of Difficulty Series 2* (Queue, Inc.)

Synthesis of Project SYNERGY Reviews for Reading

SOFTWARE ID	R032	R033	R037	R042	R045	R048	R049	R050
Reading Level (Grade Level)	11-12	9-13+	7-9	8-13+	6-10	9-13+	6-13+	4-6
# of Reviews (up to 3)	1	1	1	2	1	1	2	1
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	Y	Y	Y	X	Y	Y	Y	Y
Tutorial	–	–	Y	–	Y	Y	Y	Y
Simulation	–	–	–	–	Y	–	Y	–
Game	Y	Y	–	–	–	–	Y	Y
Comprehensive Tool	–	–	Y	–	Y	–	Y	–
Partial Tool	Y	Y	Y	N	–	–	–	–
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Word Learning Skills (46)	15	15	2	2	30	11	2	0
Functional Reading (10)	0	0	0	0	0	0	10	0
Basic Comprehension (15)	0	0	40	33	53	0	53	27
Transitional Expressions (9)	0	0	22	0	100	0	0	0
Critical Comprehension (29)	0	0	14	0	76	0	3	7
Textbook/Technical Reading (18)	0	0	0	0	0	0	22	0
Reading in Content Areas (29)	0	0	0	0	28	0	28	0
Rate & Flexibility (11)	0	0	0	9	0	0	64	0
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	0	100	100	100	100	100	100	100
Appropriateness (5)	80	80	100	100	100	60	100	80
Feedback (3)	100	100	100	0	100	67	33	100
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	100	100	100	83	100	100	83	100
Adaptability (6)	100	100	100	67	83	67	100	50
Summary Information (6)	67	67	83	67	100	83	67	67
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease of Use (7)	57	57	100	57	57	57	57	86
Adaptability (4)	50	75	75	25	50	25	75	75
Testing (3)	0	67	33	0	67	67	67	33
Tracking (2)	100	100	100	50	100	100	100	50
Interactivity (7)	86	86	86	71	100	100	57	86
Appropriateness (18)	44	44	11	11	11	72	33	33
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliability (3)	67	100	100	100	100	100	100	100
Format (7)	29	29	14	43	0	43	29	14

The publisher is shown in parentheses in the list below:

R032 *Word Attack: SAT Data Disk* (Davidson)
R033 *Word Attack: Roots & Prefixes* (Davidson)
R037 *Basic Reading Skills* (Projected Learning Programs, Inc.)
R042 *Comprehension Power: Level H: A. Lessons 1-3* (Milliken Publishing Co.)
R045 *Diascriptive Reading III* (Educational Activities, Inc.)
R048 *Intellectual SAT Vocabulary* (Queue, Inc.)
R049 *Evelyn Wood Dynamic Reader* (Timeworks)
R050 *Fundamentals of Reading* (Educational Activities, Inc.)

Synthesis of Project SYNERGY Reviews for Reading

SOFTWARE ID	R053	R056	R062	R064	R065	R067	R069	R070
Reading Level (Grade Level)	4-5	1-6	10-13+	6-8	10-12	6-10	8	2-6
# of Reviews (up to 3)	2	1	2	2	1	2	1	1
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	Y	Y	Y	Y	Y	Y	Y	–
Tutorial	Y	Y	–	–	–	Y	Y	Y
Simulation	Y	Y	Y	–	–	–	–	–
Game	Y	Y	–	–	–	–	–	–
Comprehensive Tool	Y	–	–	–	–	–	–	Y
Partial Tool	–	–	Y	Y	Y	–	Y	–
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Word Learning Skills (46)	15	9	17	0	11	15	11	0
Functional Reading (10)	100	0	0	0	0	0	0	0
Basic Comprehension (15)	33	0	27	0	20	87	53	40
Transitional Expressions (9)	44	0	0	0	0	78	67	11
Critical Comprehension (29)	3	0	10	41	48	41	0	7
Textbook / Technical Reading (18)	22	0	0	0	0	0	0	39
Reading in Content Areas (29)	14	0	0	3	0	0	0	0
Rate & Flexibility (11)	0	0	18	0	0	0	0	0
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	100	100	67	100	100	100
Appropriateness (5)	100	60	100	100	20	100	100	100
Feedback (3)	100	100	100	100	100	100	33	100
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	100	83	83	100	83	100	33	100
Adaptability (6)	100	50	100	100	17	100	50	100
Summary Information (6)	100	67	83	83	83	100	50	67
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease of Use (7)	71	71	100	43	43	43	29	43
Adaptability (4)	75	50	100	50	0	75	50	100
Testing (3)	0	0	0	0	0	0	0	67
Tracking (2)	100	100	100	50	50	100	100	100
Interactivity (7)	86	86	100	86	71	100	71	100
Appropriateness (18)	50	17	33	22	0	22	22	50
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliability (3)	100	100	100	100	100	100	100	100
Format (7)	29	29	29	29	29	29	29	43

The publisher is shown in parentheses in the list below:

R053 *How to Read for Everyday Living* (Educational Activities, Inc.)
R056 *LEEP Spelling Program* (Leep, Inc.)
R062 *Quantum* (EDL)
R064 *Reading and Thinking III* (Queue, Inc.)
R065 *Reading and Thinking IV* (Queue, Inc.)
R067 *Reading and Critical Thinking Series* (Educulture)
R069 *Ten Steps to Building College Reading Skills* (Townsend Press)
R070 *Reading IV* (Jostens Learning)

Synthesis of Project SYNERGY Reviews for Reading

SOFTWARE ID	R072	R073	R074	R075	R079	R082	R086	R087
Reading Level (Grade Level)	9-13+	8-13	8-13	2-3	5-6	3-6	1-2.5	2-3.5
# of Reviews (up to 3)	1	1	1	2	3	1	2	3
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	Y	–	–	Y	Y	Y	Y	Y
Tutorial	N	Y	Y	Y	Y	–	Y	Y
Simulation	Y	Y	Y	–	–	–	–	–
Game	–	–	–	Y	–	Y	–	–
Comprehensive Tool	–	Y	Y	–	–	–	–	–
Partial Tool	Y	–	–	Y	–	Y	Y	Y
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Word Learning Skills (46)	0	28	28	26	15	15	9	2
Functional Reading (10)	0	0	0	0	0	0	0	0
Basic Comprehension (15)	0	40	40	87	60	53	60	60
Transitional Expressions (9)	0	100	100	89	0	0	0	0
Critical Comprehension (29)	0	10	34	41	7	0	14	10
Textbook / Technical Reading (18)	0	50	50	0	0	0	0	0
Reading in Content Areas (29)	0	0	14	0	14	0	0	0
Rate & Flexibility (11)	27	0	0	45	0	0	9	9
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	100	100	100	100	100	100
Appropriateness (5)	80	100	100	100	100	100	100	100
Feedback (3)	100	100	100	100	33	0	33	67
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	83	100	100	100	83	100	100	100
Adaptability (6)	100	100	100	100	67	100	100	83
Summary Information (6)	67	67	67	83	0	83	100	67
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease of Use (7)	57	43	43	71	43	43	71	43
Adaptability (4)	50	75	75	75	75	75	100	100
Testing (3)	0	33	33	67	0	0	67	33
Tracking (2)	50	100	100	100	50	100	100	100
Interactivity (7)	71	100	100	100	71	57	100	100
Appropriateness (18)	33	56	56	28	22	56	28	11
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliability (3)	67	100	100	100	100	100	100	100
Format (7)	29	43	43	43	29	29	29	29

The publisher is shown in parentheses in the list below:

R072 *Speed Reader II* (Davidson & Associates)
R073 *Science III: GED Objectives* (Jostens Learning)
R074 *Social Studies III: GED Objectives* (Jostens Learning)
R075 *Supplement 100: Reading Efficiency System* (Weaver Instructional Systems)
R079 *How to Read in the Content Areas* (Educational Activities, Inc.)
R082 *Read 'N Roll* (Davidson & Associates)
R086 *Learning 100: Reading Strategies (AA 1-20)* (EDL)
R087 *Learning 100: Reading Strategies (BA 1-20)* (EDL)

Table 1.6

Synthesis of Project SYNERGY Reviews for Reading

SOFTWARE ID	R103	R105	R107	R110	R111	R112	R116
Reading Level (Grade Level)	6-10	6-10	13+	9-13	3-4	3-8	10-16
# of Reviews (up to 3)	2	3	1	1	1	2	2
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**						
Drill and Practice	Y	Y	Y	Y	Y	Y	X
Tutorial	–	–	Y	–	Y	Y	Y
Simulation	–	–	–	Y	–	Y	–
Game	–	–	–	–	–	–	–
Comprehensive Tool	–	–	–	–	Y	Y	–
Partial Tool	–	–	–	Y	Y	Y	N
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)							
TOPICS	**percent of objectives implemented satisfactorily**						
Word Learning Skills (46)	0	0	4	9	0	24	2
Functional Reading (10)	0	0	0	0	0	0	0
Basic Comprehension (15)	20	13	73	100	67	53	93
Transitional Expressions (9)	0	0	67	0	89	22	0
Critical Comprehension (29)	0	0	28	14	14	21	59
Textbook/Technical Reading (18)	0	0	44	22	44	0	0
Reading in Content Areas (29)	0	0	0	0	38	0	0
Rate & Flexibility (11)	0	0	0	0	0	0	36
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**						
Accuracy (3)	100	100	67	100	100	100	100
Appropriateness (5)	100	60	100	100	100	100	100
Feedback (3)	0	100	33	67	100	100	100
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**						
Ease of Implementation (6)	83	67	83	100	100	100	100
Adaptability (6)	100	67	67	67	50	100	83
Summary Information (6)	83	83	67	50	83	83	83
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**						
Ease of Use (7)	29	43	43	43	29	71	71
Adaptability (4)	75	50	25	25	100	100	75
Testing (3)	0	0	67	67	33	100	67
Tracking (2)	100	100	100	100	50	100	50
Interactivity (7)	100	71	86	71	86	100	100
Appropriateness (18)	11	11	11	22	56	44	33
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**						
Reliability (3)	100	100	67	100	100	100	100
Format (7)	29	29	29	29	43	43	29

The publisher is shown in parentheses in the list below:

R103 *Reading for Enrichment: Main Idea* (Queue, Inc.)
R105 *Reading for Enrichment: Finding the Facts* (Queue, Inc.)
R107 *DOEL Reading Skills* (Wisc-Ware)
R110 *Intellectual PSAT/SAT Reading Comprehension* (Queue, Inc.)
R111 *Reading for Information: Level II* (IBM)
R112 *Diascriptive Reading II* (Educational Activities, Inc.)
R116 *Comprehensive Power: Levels J, K, L* (Milliken Publishing Co.)

Synthesis of Project SYNERGY Reviews for Writing

SOFTWARE ID	W001	W002	W003	W004	W005	W007	W008	W009
Reading Level	11	6-13+	8-13	10	8-13+	10-12	12-13+	10
# of Reviews (up to 3)	1	3	2	2	2	3	2	2
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	–	–	–	–	Y	–	–	–
Tutorial	–	Y	Y	Y	Y	–	Y	Y
Simulation	Y	–	–	–	Y	–	–	–
Game	–	–	–	–	–	–	–	–
Comprehensive Tool	–	X	–	Y	Y	–	–	–
Partial Tool	–	–	Y	–	–	Y	Y	Y
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Prewiting (12)	50	33	50	50	67	25	17	42
Writing (25)	36	16	76	72	68	0	8	56
Revision (12)	42	8	67	100	100	0	0	58
Editing (25)	0	8	0	48	28	4	0	0
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	67	100	100	100	100	100	100	100
Appropriateness (5)	80	60	100	100	100	100	100	60
Feedback (3)	0	0	100	100	100	0	100	33
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	50	67	83	100	100	83	100	83
Adaptability (6)	50	83	100	100	83	50	100	67
Summary Information (6)	83	17	83	83	83	17	100	67
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease (7)	29	71	71	100	100	71	57	29
Adaptability (4)	50	50	100	100	75	75	100	50
Testing (3)	0	0	0	0	100	0	0	0
Tracking (2)	0	0	100	100	100	0	100	100
Interactivity (7)	57	0	86	100	100	86	100	71
Appropriateness (18)	11	17	33	33	11	33	11	11
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliabilty (3)	67	100	100	100	100	100	100	100
Format (7)	29	43	43	29	43	43	29	29

The publisher is shown in parentheses in the list below:

W001 *Thoughtline: The Intelligent Writer's Companion* (Xpercom)
W002 *Fine Lines* (Houghton Mifflin)
W003 *The Writing Tutor* (Harcourt Brace Jovanovich)
W004 *Writer's Helper Stage II* (Conduit)
W005 *Writing is Thinking* (Kapstrom, Inc.)
W007 *Wordbench: The Tool for People Who Write* (Addison Wesley Publishing Company, Inc.)
W008 *SEEN* (Conduit)
W009 *Prewriting* (National Collegiate Software Clearinghouse)

Synthesis of Project SYNERGY Reviews for Writing

SOFTWARE ID	W010	W011	W012	W015	W016	W017	W018	W019
Reading Level	10	11	3-9	13+	8	7-8	7-8	9
# of Reviews (up to 3)	2	1	1	2	2	2	3	1
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	Y	–	N	Y	–	Y	Y	Y
Tutorial	Y	N	N	Y	Y	Y	X	Y
Simulation	–	–	–	–	–	Y	–	–
Game	–	–	–	–	–	–	X	–
Comprehensive Tool	–	–	–	–	Y	Y	–	–
Partial Tool	Y	Y	–	Y	Y	–	–	–
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Prewiting (12)	0	42	0	0	50	0	0	83
Writing (25)	0	24	16	0	24	0	0	76
Revision (12)	8	67	0	17	25	0	25	100
Editing (25)	28	0	0	40	28	32	24	92
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	67	100	100	100	100	100	100
Appropriateness (5)	100	40	80	80	100	100	80	100
Feedback (3)	100	67	33	100	100	33	0	100
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	100	33	100	100	100	100	83	100
Adaptability (6)	50	50	33	67	67	100	83	100
Summary Information (6)	50	67	33	50	33	67	67	100
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease (7)	100	0	43	57	100	43	0	100
Adaptability (4)	25	25	25	50	75	75	50	100
Testing (3)	67	0	33	33	0	67	67	100
Tracking (2)	100	0	50	50	100	100	100	100
Interactivity (7)	71	14	14	100	100	100	71	100
Appropriateness (18)	33	11	0	11	11	72	39	100
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliabilty (3)	100	100	100	100	100	100	100	100
Format (7)	29	29	43	29	43	43	43	29

The publisher is shown in parentheses in the list below:

W010 *Comma Sense I 1985* (Wisc-Ware)
W011 *Organize* (Wadsworth Publishing Company)
W012 *Skills Bank* (Skills Bank Corporation)
W015 *English Achievement* (Queue, Inc.)
W016 *HBJ Writer* (Harcourt Brace Jovanovich)
W017 *Punctuation Level IV* (Jostens Learning)
W018 *Combining Sentences Level IV* (Jostens Learning)
W019 *The Holt Writing Tutor* (Harcourt Brace Jovanovich)

Table 2.2

Synthesis of Project SYNERGY Reviews for Writing

SOFTWARE ID	W021	W022	W024	W025	W026	W027	W031	W032
Reading Level	10-13+	8-13+	6-10	6-13+	11	7	9-13+	9-10
# of Reviews (up to 3)	3	1	3	2	1	1	3	3
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	–	–	Y	Y	–	Y	Y	–
Tutorial	–	–	Y	Y	–	Y	X	–
Simulation	–	–	–	–	–	–	–	–
Game	–	–	–	–	–	–	–	–
Comprehensive Tool	–	Y	–	–	–	Y	–	–
Partial Tool	X	–	X	Y	Y	–	Y	Y
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Prewiting (12)	0	0	0	42	58	0	0	33
Writing (25)	0	0	0	56	24	0	0	20
Revision (12)	0	0	0	50	50	0	0	33
Editing (25)	40	40	60	16	0	80	16	76
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	100	100	100	100	100	100
Appropriateness (5)	60	60	100	100	100	100	60	60
Feedback (3)	33	33	100	100	0	0	0	0
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	100	100	83	83	83	100	33	83
Adaptability (6)	83	50	67	67	50	83	17	67
Summary Information (6)	67	83	0	83	17	83	50	17
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease (7)	71	29	71	100	57	100	43	71
Adaptability (4)	25	0	75	0	75	50	25	25
Testing (3)	0	0	33	0	0	100	33	0
Tracking (2)	100	100	100	100	0	100	50	0
Interactivity (7)	71	43	86	100	43	86	43	14
Appropriateness (18)	28	22	50	56	11	33	11	39
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliabilty (3)	100	67	100	100	100	100	100	67
Format (7)	29	29	29	29	29	29	29	43

The publisher is shown in parentheses in the list below:

W021 *Grammatik IV* (References Software, Inc.)
W022 *Rightwriter 3.1* (Que Software)
W024 *Blue Pencil Authoring System* (Prentice Hall Press)
W025 *CAW: Computer Assisted Writing* (Educational Activities, Inc.)
W026 *The Computer Writing Resource Kit* (D.C. Heath and Company)
W027 *COMSKL-PC* (Fox Valley Technical College)
W031 *Practical Composition Series I–V* (Educulture)
W032 *Norton Textra 2.0* (W.W. Norton and Company, Inc.)

Synthesis of Project SYNERGY Reviews for Writing

SOFTWARE ID	W033	W037	W039	W040	W042	W043	W045	W046
Reading Level	12	7-12	7-12	13	6-13+	8	4-10	8-10
# of Reviews (up to 3)	1	2	1	1	2	1	2	3
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	–	–	Y	–	Y	–	Y	Y
Tutorial	Y	–	Y	Y	Y	–	Y	Y
Simulation	–	–	Y	–	–	–	Y	–
Game	–	–	–	–	–	–	–	–
Comprehensive Tool	–	–	–	–	–	–	–	–
Partial Tool	–	Y	Y	Y	–	Y	–	Y
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Prewiting (12)	8	33	0	25	–	0	25	8
Writing (25)	0	32	0	8	–	0	24	8
Revision (12)	0	0	0	17	–	0	0	0
Editing (25)	0	0	4	0	–	4	0	0
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	100	67	100	100	100	100
Appropriateness (5)	80	60	100	100	80	40	100	80
Feedback (3)	0	0	0	67	33	67	33	33
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	83	100	67	83	33	100	100	67
Adaptability (6)	50	50	67	100	67	17	67	50
Summary Information (6)	17	17	0	17	17	17	17	33
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease (7)	71	57	57	29	43	100	43	43
Adaptability (4)	25	75	75	100	75	50	75	50
Testing (3)	0	0	0	0	33	0	0	0
Tracking (2)	0	0	0	0	100	50	0	100
Interactivity (7)	0	57	29	71	86	57	29	100
Appropriateness (18)	6	17	17	33	44	17	11	11
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliabilty (3)	100	100	100	100	100	100	100	100
Format (7)	29	29	14	43	29	43	29	43

The publisher is shown in parentheses in the list below:

W033 *College Writer* (Prentice Hall Press)

W037 *First Draft* (Scholastic, Inc.)

W039 *Mind Reader* (Brown Bag Software)

W040 *Mind Writer* (Daedalus Group, Inc.)

W042 *101 Misused Words* (Projected Learning Programs, Inc.) (This package provides practice on commonly misused words, primarily homonyms, not covered in the topics of this table.)

W043 *PFS: Professional Write 2.1* (Scott Foresman and Company)

W045 *Proteus: The Idea Generator* (Projected Learning Programs, Inc.)

W046 *Persuasive Essay III* (Queue, Inc.)

Synthesis of Project SYNERGY Reviews for Writing

SOFTWARE ID	W048	W050	W055	W057	W060	W061	W062	W066
Reading Level	12-13+	11	5-8	6-10	5-6	5-8	8	8
# of Reviews (up to 3)	1	1	3	1	2	2	2	1
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	N	–	Y	–	–	Y	Y	–
Tutorial	Y	–	X	Y	N	Y	Y	–
Simulation	N	Y	–	–	N	Y	–	Y
Game	–	–	–	–	Y	–	–	–
Comprehensive Tool	–	–	–	–	–	–	–	–
Partial Tool	Y	–	Y	Y	N	Y	Y	–
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Prewiting (12)	0	25	0	0	0	33	0	42
Writing (25)	0	32	20	0	0	64	0	4
Revision (12)	0	50	25	0	0	75	0	25
Editing (25)	12	4	24	8	12	52	20	0
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	67	100	100	100	100	100	100
Appropriateness (5)	100	100	60	100	40	100	100	100
Feedback (3)	0	33	67	0	0	33	67	100
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	17	50	67	83	67	83	100	83
Adaptability (6)	17	17	50	0	67	83	67	50
Summary Information (6)	0	17	33	17	17	67	83	0
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease (7)	14	14	43	57	57	71	100	57
Adaptability (4)	0	75	0	75	100	75	50	25
Testing (3)	0	0	0	0	0	67	67	0
Tracking (2)	50	0	0	0	0	100	100	0
Interactivity (7)	14	71	100	14	29	100	86	14
Appropriateness (18)	6	22	6	33	44	11	56	22
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliabilty (3)	67	67	67	100	100	100	100	100
Format (7)	29	43	29	29	29	29	29	29

The publisher is shown in parentheses in the list below:

W048 *Punctuation* (Projected Learning Programs, Inc.)
W050 *Report Writing* (Compris)
W055 *Writing Skills: Learning to Write* (Queue, Inc.)
W057 *Webster's New World Writer* (Prentice Hall Press)
W060 *Snowball* (Wisc-Ware)
W061 *Writing Skills Series: Developing Writing Skills* (Queue, Inc.)
W062 *Comma Sense II* (Wisc-Ware)
W066 *Super Scoop* (Queue, Inc.)

Synthesis of Project SYNERGY Reviews for Writing

SOFTWARE ID	W068	W074	W075	W076	W077	W078	W080	W082
Reading Level	13+	8-12	11	9-13+	6-10	7	8-13+	12
# of Reviews (up to 3)	1	2	1	1	1	1	2	1
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	Y	Y		N		Y		N
Tutorial	N	Y		N		Y		
Simulation		Y						
Game							Y	
Comprehensive Tool								
Partial Tool		Y	N		Y		Y	
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Prewriting (12)	0	0	0	0	58	0	17	0
Writing (25)	4	0	0	8	32	0	72	0
Revision (12)	25	0	0	0	42	0	75	0
Editing (25)	16	32	20	68	0	32	68	64
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	67	33	67	100	100	0
Appropriateness (5)	80	100	100	80	80	100	100	60
Feedback (3)	33	100	67	33	67	0	100	0
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	100	100	83	67	67	67	83	50
Adaptability (6)	83	100	100	50	83	83	100	33
Summary Information (6)	83	100	67	50	100	100	17	67
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease (7)	43	100	43	29	71	43	43	43
Adaptability (4)	25	75	100	50	50	25	75	0
Testing (3)	67	0	0	67	0	0	0	0
Tracking (2)	50	50	50	0	0	50	50	50
Interactivity (7)	100	71	71	71	29	57	71	0
Appropriateness (18)	11	78	33	11	28	28	50	6
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliabilty (3)	100	100	100	100	100	100	100	67
Format (7)	43	57	43	29	29	29	29	43

The publisher is shown in parentheses in the list below.

W068 *Skills Bank II* (Skills Bank Corporation)
W074 *Ami Professional* (Samna Corporation)
W075 *PC Proof* (Lexpertise Linguistic Software)
W076 *Parlance* (Parlance Software)
W077 *Maxthink 89* (Maxthink, Inc.)
W078 *Mark Up: A Punctuation Tool* (Research Design Associates, Inc.)
W080 *Tanglers* (Research Design Associates, Inc.)
W082 *Grammar: What Big Teeth You Have!* (Krell Software, Inc.)

Synthesis of Project SYNERGY Reviews for Writing

SOFTWARE ID	W083	W084	W087	W091	W092	W093	W094	W096
Reading Level	11	3-6	10	6-10	8	10	10	11-13+
# of Reviews (up to 3)	2	2	1	2	3	1	2	1
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	–	X	–	Y	Y	–	–	–
Tutorial	Y	N	Y	Y	X	Y	Y	N
Simulation	–	Y	–	–	–	–	–	–
Game	–	Y	–	–	–	–	–	–
Comprehensive Tool	–	–	–	–	–	–	Y	–
Partial Tool	Y	Y	Y	Y	Y	Y	–	Y
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Prewriting (12)	8	0	42	0	0	0	0	0
Writing (25)	20	0	48	28	28	0	12	0
Revision (12)	58	0	0	58	58	0	42	0
Editing (25)	96	60	0	64	36	4	84	56
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	100	100	67	100	100	100
Appropriateness (5)	60	100	100	100	60	20	80	40
Feedback (3)	33	100	67	100	0	0	100	33
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	83	83	67	100	83	33	83	33
Adaptability (6)	67	100	67	67	50	50	100	100
Summary Information (6)	67	100	17	50	83	17	83	67
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease (7)	57	43	71	43	43	43	71	71
Adaptability (4)	25	75	100	0	0	25	100	75
Testing (3)	33	67	0	33	0	0	0	0
Tracking (2)	50	100	100	50	100	0	50	0
Interactivity (7)	14	86	43	100	71	14	71	86
Appropriateness (18)	33	100	22	6	6	22	6	11
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliability (3)	100	100	100	100	100	100	100	67
Format (7)	29	57	43	29	29	29	29	43

The publisher is shown in parentheses in the list below:

W083 *Edit!* (McGraw-Hill)
W084 *Grammar Gremlins* (Davidson & Associates)
W087 *Prewriter* (Prentice Hall Press)
W091 *Vocabulary Series* (Queue, Inc.)
W092 *Developing Writing Skills* (Queue, Inc.)
W093 *Bank Street Writer* (Scholastic, Inc.)
W094 *Editor* (TASL)
W096 *Correct Grammar 3.0* (Writing Tools Group)

Synthesis of Project SYNERGY Reviews for Writing

SOFTWARE ID	W097	W099	W101	W105	W106	W107		
Reading Level	6	12-13+	13+	11	9	6-13+		
# of Reviews (up to 3)	1	1	1	1	1	1		
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	Y	Y	Y	–	Y	Y		
Tutorial	Y	–	–	–	N	–		
Simulation	Y	–	–	Y	–	–		
Game	–	–	–	–	–	–		
Comprehensive Tool	Y	–	–	–	–	–		
Partial Tool	–	–	Y	Y	Y	Y		
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Prewriting (12)	0	0	0	42	0	0		
Writing (25)	0	0	0	32	0	24		
Revision (12)	0	33	8	58	0	25		
Editing (25)	56	0	36	0	56	0		
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	67	100	100	100		
Appropriateness (5)	100	60	40	100	80	100		
Feedback (3)	0	67	33	0	100	33		
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	100	67	100	33	100	100		
Adaptability (6)	100	100	67	67	17	50		
Summary Information (6)	50	67	50	17	67	100		
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease (7)	71	14	29	29	86	86		
Adaptability (4)	100	25	50	25	0	25		
Testing (3)	100	33	0	0	100	100		
Tracking (2)	100	50	0	0	100	100		
Interactivity (7)	86	43	100	29	100	86		
Appropriateness (18)	56	6	28	33	33	33		
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliability (3)	100	100	100	100	100	100		
Format (7)	57	14	29	29	14	14		

The publisher is shown in parentheses in the list below:

W097 *Grammar Mastery II, A,B,C* (American Language Academy)

W099 *Basic Composition Paragraphs Package* (Queue, Inc.)

W101 *Perfect Copy* (Logicus Incorporated)

W105 *Writer's Prologue* (Daedalus Group, Inc.)

W106 *English Language Instructional Systems: Grammar, Usage* (Weaver Instructional Systems)

W107 *Reading Efficiency System* (Weaver Instructional Systems)

Synthesis of Project SYNERGY Reviews for Math

SOFTWARE ID	M001	M002	M003	M004	M005	M006	M008	M009	M010
# of Reviews (up to 3)	3	3	3	1	1	3	3	3	2
INSTRUCTIONAL MODE	Implemented Satisfactorily? Y=yes, N=no, X=mixed								
Drill and Practice	Y	X	X	Y	Y	X	Y	Y	Y
Tutorial	–	–	–	Y	Y	X	–	Y	Y
Simulation	–	–	–	Y	Y	–	–	–	Y
Game	–	–	–	Y	–	–	–	–	–
Comprehensive Tool	–	–	–	–	–	–	–	–	–
Partial Tool	–	–	–	Y	Y	X	Y	Y	Y
C O V E R A G E	(Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	percent of objectives implemented satisfactorily								
Base Ten Notation (8)	25	0	0	63	38	100	0	0	25
Basic Ops / Whole Numbers (10)	50	0	0	50	50	100	0	0	30
Prime Numbers & Factorization (4)	25	0	0	25	100	100	0	0	75
Basic Ops / Positive Fractions (19)	63	0	0	79	21	89	32	0	74
Basic Ops / Positive Decimals (13)	15	0	0	69	46	92	0	0	0
Ratio and Proportions (6)	0	0	0	83	100	83	0	0	0
Percents (7)	86	0	0	100	71	100	29	0	0
Units of Measure (10)	0	0	0	100	0	100	0	0	0
Basic Geometry (41)	0	0	0	98	0	0	0	0	39
Basic Ops / Signed Numbers (10)	0	60	0	80	90	100	60	0	100
Real Numbers (25)	16	32	0	44	96	4	32	32	92
Set Notation (7)	0	0	0	0	0	0	0	0	57
Simple Linear Eq / One Variable (7)	43	43	57	57	71	0	100	71	86
Simple Linear Ineq / One Variable (6)	0	0	67	67	83	0	83	67	100
Integer Exponents (9)	22	44	44	78	89	0	56	0	56
Polynomials (18)	0	33	22	11	83	0	22	44	78
Factoring (6)	0	17	17	0	67	0	83	0	83
Graphs (21)	0	38	29	38	95	0	43	76	5
Solving Systems of Equations (9)	0	22	22	0	100	0	67	78	0
Quadratics (9)	0	33	44	0	89	0	56	0	44
Rational Expressions (5)	0	80	60	0	60	0	80	0	0
Rational Exponents & Radicals (9)	0	44	56	0	44	0	33	0	0
Geometry (7)	0	0	0	86	14	0	0	0	14
CONTENT ATTRIBUTES	percent of attributes implemented satisfactorily								
Accuracy (3)	100	100	100	100	67	100	100	100	100
Appropriateness (5)	80	80	80	100	100	100	100	100	100
Feedback (3)	0	33	33	33	100	33	100	33	100
MEETING FACULTY NEEDS	percent of needs implemented satisfactorily								
Ease of Implementation (6)	100	100	100	100	83	100	83	83	100
Adaptability (6)	83	100	100	100	83	100	67	100	100
Summary Information (6)	50	100	83	83	83	100	33	83	83
MEETING STUDENT NEEDS	percent of needs implemented satisfactorily								
Ease of Use (7)	43	43	29	71	29	43	43	29	100
Adaptability (4)	75	50	50	75	25	50	75	75	75
Testing (3)	0	0	0	100	67	33	0	0	67
Tracking (2)	50	50	50	100	50	100	100	100	100
Interactivity (7)	71	100	100	86	43	71	100	100	86
Appropriateness (18)	11	33	11	61	33	17	50	56	100
SOFTWARE OPERATIONS	percent of attributes implemented satisfactorily								
Reliability (3)	100	67	100	100	33	100	100	100	100
Format (7)	29	43	29	43	43	43	29	43	43

The publisher is shown in parentheses in the list below.

M001 *Pre-Algebra/The Math Lab* (The Math Lab)
M002 *Beginning Algebra/The Math Lab* (The Math Lab)
M003 *Intermediate Algebra/The Math Lab* (The Math Lab)
M004 *Math III* (Jostens Learning)
M005 *Algebra* (Jostens Learning)
M006 *Individual Skills Bank II* (Skills Bank Corporation)
M008 *Algebra Drill and Practice I,II,III* (Conduit)
M009 *Algebra I, Part I* (IBM)

Synthesis of Project SYNERGY Reviews for Math

SOFTWARE ID	M011	M014	M015	M016	M018	M019	M020	M021	M022
# of Reviews (up to 3)	1	1	1	1	2	3	3	2	2
INSTRUCTIONAL MODE	Implemented Satisfactorily? Y=yes, N=no, X=mixed								
Drill and Practice	Y	Y	Y	Y	X	X	Y	X	Y
Tutorial	Y	Y	–	Y	X	–	X	N	–
Simulation	–	Y	–	–	–	X	–	–	–
Game	–	Y	Y	–	–	–	–	–	Y
Comprehensive Tool	–	–	–	–	Y	–	–	–	–
Partial Tool	–	Y	Y	Y	Y	X	Y	–	X
C O V E R A G E	(Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	percent of objectives implemented satisfactorily								
Base Ten Notation (8)	0	38	0	0	100	0	0	0	0
Basic Ops: Whole Numbers (10)	40	50	40	0	100	0	0	0	40
Prime Numbers & Factorization (4)	0	0	0	0	100	0	0	0	0
Basic Ops: Positive Fractions (19)	47	74	32	0	74	16	0	0	0
Basic Ops: Positive Decimals (13)	62	69	31	0	69	0	0	0	0
Ratio and Proportions (6)	0	100	0	100	83	0	0	0	0
Percents (7)	0	86	0	0	71	0	0	0	0
Units of Measure (10)	10	0	0	0	100	0	0	0	0
Basic Geometry (41)	0	63	0	20	49	0	0	0	0
Basic Ops: Signed Numbers (10)	0	10	0	50	40	0	60	10	0
Real Numbers (25)	16	32	0	0	20	0	16	40	0
Set Notation (7)	0	0	0	0	0	0	0	0	0
Simple Linear Eq.: One Variable (7)	0	29	0	29	57	0	57	57	0
Simple Linear Ineq.: One Variable (6)	0	17	0	0	0	0	33	0	0
Integer Exponents (9)	0	0	0	0	56	0	44	0	0
Polynomials (18)	0	0	0	11	0	0	17	0	0
Factoring (6)	0	0	0	0	0	0	67	0	0
Graphs (21)	0	24	0	81	24	10	5	0	0
Solving Systems of Equations (9)	0	0	0	67	0	0	22	0	0
Quadratics (9)	0	0	0	78	0	11	44	0	0
Rational Expressions (5)	0	0	0	40	0	0	60	0	0
Rational Exponents & Radicals (9)	0	0	0	44	0	0	44	0	0
Geometry (7)	0	43	0	14	29	0	0	0	0
CONTENT ATTRIBUTES	percent of attributes implemented satisfactorily								
Accuracy (3)	67	100	100	100	100	100	100	67	100
Appropriateness (5)	80	80	80	80	100	80	60	40	80
Feedback (3)	33	0	0	100	67	0	33	67	0
MEETING FACULTY NEEDS	percent of needs implemented satisfactorily								
Ease of Implementation (6)	100	100	83	100	100	50	67	67	67
Adaptability (6)	50	83	100	100	100	83	67	83	67
Summary Information (6)	17	67	67	33	67	0	83	83	0
MEETING STUDENT NEEDS	percent of needs implemented satisfactorily								
Ease of Use (7)	29	57	29	100	71	57	29	29	29
Adaptability (4)	50	50	75	75	100	50	75	0	100
Testing (3)	67	33	0	33	33	0	0	33	0
Tracking (2)	50	100	100	0	100	0	100	50	100
Interactivity (7)	71	86	86	57	100	0	86	71	86
Appropriateness (18)	17	56	33	78	94	50	17	22	72
SOFTWARE OPERATIONS	percent of attributes implemented satisfactorily								
Reliability (3)	0	67	100	100	100	100	0	33	100
Format (7)	43	43	43	43	43	29	43	29	29

The publisher is shown in parentheses in the list below.

M011 *SLS 6000 Tutorvista* (BLS)
M014 *Math Concepts Level IV* (Instem Learning)
M015 *Math Practice Level IV* (Instem Learning)
M016 *First Year Algebra Part II* (Conduit)
M018 *Computer Assisted Instruction* (SRA Thinkware Products)
M019 *Algebra – The Kenseth Kurtz Math Series* (True Basic)
M020 *Expert Algebra Tutor* (Tusoft)
M021 *Integers and Equations Parts I & II* (Hartley Courseware)
M022 *King's Rule: the 1 Mathematics and Discovery* (Sunburst Communications) (This is a hypothesis-testing package that covers only one of the topics in this table.)

Table 3.2

Synthesis of Project SYNERGY Reviews for Math

SOFTWARE ID	M023	M025	M026	M027	M030	M031	M032	M033	M034
# of Reviews (up to 3)	2	1	3	3	1	3	1	3	1
INSTRUCTIONAL MODE	Implemented Satisfactorily? Y=yes, N=no, X=mixed								
Drill and Practice	Y	Y	Y	Y	Y	Y	Y		
Tutorial	Y	Y	Y	Y	Y	Y	Y		N
Simulation	Y	Y	–	–	–	–	–	Y	–
Game	Y	–	Y	Y	–	–	–	Y	–
Comprehensive Tool	–	–	–	–	Y	–	–	–	–
Partial Tool	Y	Y	Y	Y	–	–	–	–	N
C O V E R A G E	(Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	percent of objectives implemented satisfactorily								
Base Ten Notation (8)	0	0	0	0	0	0	0	0	0
Basic Ops / Whole Numbers (10)	0	0	0	0	0	0	0	0	10
Prime Numbers & Factorization (4)	0	0	0	0	0	0	0	50	0
Basic Ops / Positive Fractions (19)	0	0	0	0	0	0	0	16	0
Basic Ops / Positive Decimals (13)	0	0	0	0	0	0	0	23	0
Ratio and Proportions (6)	0	0	0	0	0	0	0	0	0
Percents (7)	0	0	0	0	0	0	0	0	0
Units of Measure (10)	0	0	0	0	0	0	0	0	0
Basic Geometry (41)	0	0	0	0	0	0	0	5	0
Basic Ops / Signed Numbers (10)	60	0	0	0	0	0	0	0	0
Real Numbers (25)	36	0	28	36	0	72	0	0	0
Set Notation (7)	0	0	0	0	0	0	0	0	0
Simple Linear Eq / One Variable (7)	43	71	43	86	0	71	43	29	0
Simple Linear Ineq / One Variable (6)	0	0	0	83	0	0	0	0	0
Integer Exponents (9)	0	0	33	0	0	33	0	0	0
Polynomials (18)	0	0	28	0	0	83	11	0	0
Factoring (6)	0	0	50	0	0	100	50	0	0
Graphs (21)	43	67	33	0	81	38	0	0	0
Solving Systems of Equations (9)	0	67	44	0	78	0	56	22	0
Quadratics (9)	0	89	56	0	0	67	44	0	0
Rational Expressions (5)	0	60	60	0	0	100	0	0	0
Rational Exponents & Radicals (9)	0	33	0	0	0	0	0	0	0
Geometry (7)	0	14	0	0	0	0	0	0	0
CONTENT ATTRIBUTES	percent of attributes implemented satisfactorily								
Accuracy (3)	100	100	100	100	100	100	100	100	100
Appropriateness (5)	100	100	80	100	100	80	100	100	100
Feedback (3)	100	33	33	33	0	33	100	0	100
MEETING FACULTY NEEDS	percent of needs implemented satisfactorily								
Ease of Implementation (6)	100	83	100	100	83	100	100	83	83
Adaptability (6)	100	67	100	67	50	83	100	33	67
Summary Information (6)	83	83	83	83	50	83	50	0	0
MEETING STUDENT NEEDS	percent of needs implemented satisfactorily								
Ease of Use (7)	57	29	43	43	43	71	100	86	43
Adaptability (4)	75	25	25	75	75	75	100	25	50
Testing (3)	67	33	0	33	33	0	100	0	67
Tracking (2)	100	100	50	100	100	100	100	50	100
Interactivity (7)	100	57	71	86	71	100	100	71	71
Appropriateness (18)	39	56	78	28	11	33	33	50	22
SOFTWARE OPERATIONS	percent of attributes implemented satisfactorily								
Reliability (3)	100	100	100	100	100	100	100	100	100
Format (7)	29	43	29	29	29	43	100	29	29

The publisher is shown in parentheses in the list below.

M023 *Microcomputer Curriculum Project Pre-Algebra Vols. I & II* (Price Laboratory School)

M025 *Algebra II: Part I* (IBM)

M026 *Alge-Blaster Plus* (Davidson & Associates)

M027 *Microcomputer Curriculum Project Algebra I* (Price Laboratory School)

M030 *Microcomputer Curriculum Project Algebra I Vol. 2* (Price Laboratory School)

M031 *Algebra Mentor* (Brooks and Cole)

M032 *Algebra Series* (5 of 7 disks) (Queue, Inc.)

M033 *Algebra Step* (Scholastic, Inc.)

M034 *Algebra Equation Solving Skills* (Educational Design Inc.)

Synthesis of Project SYNERGY Reviews for Math

SOFTWARE ID	M035	M036	M037	M039	M041	M043	M047	M050	M051
# of Reviews (up to 3)	2	1	2	1	1	2	3	2	1
INSTRUCTIONAL MODE	Implemented Satisfactorily? Y=yes, N=no, X=mixed								
Drill and Practice	N	N	–	Y	Y	N	Y	Y	Y
Tutorial	X	N	–	Y	Y	N	–	Y	Y
Simulation	–	–	–	–	–	–	–	Y	Y
Game	–	–	–	–	–	–	Y	Y	–
Comprehensive Tool	–	–	Y	–	–	–	–	–	Y
Partial Tool	Y	–	–	Y	Y	Y	Y	X	–
C O V E R A G E	(Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	percent of objectives implemented satisfactorily								
Base Ten Notation (8)	75	0	25	0	0	0	0	0	0
Basic Ops / Whole Numbers (10)	100	0	60	60	0	30	0	0	0
Prime Numbers & Factorization (4)	25	0	75	50	0	25	0	0	0
Basic Ops / Positive Fractions (19)	74	0	53	74	68	58	0	0	0
Basic Ops / Positive Decimals (13)	69	0	69	69	0	31	0	0	0
Ratio and Proportions (6)	33	67	17	17	0	0	0	33	0
Percents (7)	100	0	71	86	0	29	0	0	0
Units of Measure (10)	90	20	0	0	0	0	0	0	0
Basic Geometry (41)	54	10	0	0	0	0	0	93	0
Basic Ops / Signed Numbers (10)	20	0	70	80	0	0	0	0	0
Real Numbers (25)	0	0	16	24	0	0	0	0	64
Set Notation (7)	0	0	0	0	0	0	0	0	0
Simple Linear Eq / One Variable (7)	0	86	71	43	0	0	0	0	86
Simple Linear Ineq / One Variable (6)	0	33	33	0	0	0	0	0	67
Integer Exponents (9)	0	56	67	0	0	0	0	0	100
Polynomials (18)	0	11	50	11	0	0	0	0	100
Factoring (6)	0	50	67	0	0	0	0	0	83
Graphs (21)	0	0	24	0	0	0	33	0	95
Solving Systems of Equations (9)	0	33	33	0	0	0	0	0	78
Quadratics (9)	0	33	33	0	0	0	0	0	100
Rational Expressions (5)	0	0	100	0	0	0	0	0	100
Rational Exponents & Radicals (9)	0	22	78	0	0	0	0	0	56
Geometry (7)	0	0	0	0	0	0	0	86	0
CONTENT ATTRIBUTES	percent of attributes implemented satisfactorily								
Accuracy (3)	100	67	100	67	100	67	100	67	100
Appropriateness (5)	80	60	80	60	80	100	80	100	100
Feedback (3)	100	0	0	33	33	33	0	100	33
MEETING FACULTY NEEDS	percent of needs implemented satisfactorily								
Ease of Implementation (6)	100	67	67	67	33	50	100	100	100
Adaptability (6)	50	83	100	50	100	100	67	100	100
Summary Information (6)	83	83	0	83	17	0	50	100	50
MEETING STUDENT NEEDS	percent of needs implemented satisfactorily								
Ease of Use (7)	71	14	57	29	43	43	71	71	43
Adaptability (4)	0	50	50	75	0	75	50	75	100
Testing (3)	67	33	0	0	0	33	0	33	0
Tracking (2)	100	50	0	0	100	100	50	100	100
Interactivity (7)	71	29	14	86	86	71	57	86	100
Appropriateness (18)	78	6	72	33	17	33	56	56	78
SOFTWARE OPERATIONS	percent of attributes implemented satisfactorily								
Reliability (3)	100	100	67	0	100	100	100	100	100
Format (7)	43	29	29	29	71	29	29	43	43

The publisher is shown in parentheses in the list below.

M035 *Bl S Tutor Courseware 4000M* (BLS)
M036 *Concepts in Algebra* (Queue, Inc.)
M037 *Derive* (Soft Warehouse, Inc.)
M039 *Expert Tutor for Arithmetic* (Tusoft)
M041 *Fraction Series* (Queue, Inc.)
M043 *Fundamentals of Math* (Queue, Inc.) (This is basically a testing package.)
M047 *Green Globs and Graphing Equations* (Sunburst Communications)
M050 *Geometry One: Foundations* (Jostens Learning)
M051 *IBM Personal Computer Algebra Series* (Jostens Learning)

Table 3.4

Synthesis of Project SYNERGY Reviews for Math

SOFTWARE ID	M053	M057	M059	M060	M064	M065	M066	M068	M071
# of Reviews (up to 3)	1	2	1	2	1	1	1	1	2
INSTRUCTIONAL MODE	Implemented Satisfactorily? Y=yes, N=no, X=mixed								
Drill and Practice	Y	Y	–	Y	Y	Y	Y	Y	Y
Tutorial	Y	Y	–	Y	Y	Y	N	Y	Y
Simulation	Y	–	–	Y	Y	Y	Y	–	Y
Game	–	–	–	–	Y		Y	–	–
Comprehensive Tool	–	–	Y	Y	–	–	–	–	–
Partial Tool	Y	Y	Y	–	Y	Y	N	–	Y
C O V E R A G E	(Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	percent of objectives implemented satisfactorily								
Base Ten Notation (8)	50	25	0	100	0	0	0	13	0
Basic Ops / Whole Numbers (10)	10	40	60	100	0	0	0	10	0
Prime Numbers & Factorization (4)	0	0	75	100	0	0	0	0	0
Basic Ops / Positive Fractions (19)	89	63	47	100	0	11	26	11	0
Basic Ops / Positive Decimals (13)	77	38	54	100	0	0	15	0	0
Ratio and Proportions (6)	100	0	17	100	0	33	50	100	0
Percents (7)	100	86	0	100	0	14	57	0	0
Units of Measure (10)	0	0	0	0	0	60	0	0	0
Basic Geometry (41)	68	0	0	0	0	49	46	0	0
Basic Ops / Signed Numbers (10)	70	0	70	100	20	50	0	0	0
Real Numbers (25)	0	12	16	0	20	28	0	0	0
Set Notation (7)	0	0	0	0	0	0	0	0	0
Simple Linear Eq / One Variable (7)	0	43	43	0	0	0	0	0	0
Simple Linear Ineq / One Variable (6)	0	0	0	0	0	0	0	0	0
Integer Exponents (9)	0	11	56	0	0	67	0	44	0
Polynomials (18)	0	22	50	0	0	0	0	0	0
Factoring (6)	0	50	67	0	0	0	0	0	0
Graphs (21)	0	29	57	0	29	14	0	0	52
Solving Systems of Equations (9)	0	11	44	0	0	0	0	0	33
Quadratics (9)	0	22	44	0	0	0	0	0	33
Rational Expressions (5)	0	0	100	0	0	0	0	0	0
Rational Exponents & Radicals (9)	0	0	78	0	0	0	0	78	0
Geometry (7)	0	0	0	0	0	43	0	0	0
CONTENT ATTRIBUTES	percent of attributes implemented satisfactorily								
Accuracy (3)	100	100	100	100	100	100	67	100	100
Appropriateness (5)	100	80	80	100	100	40	100	100	100
Feedback (3)	33	33	0	100	100	100	0	100	33
MEETING FACULTY NEEDS	percent of needs implemented satisfactorily								
Ease of Implementation (6)	83	33	67	100	50	83	50	67	100
Adaptability (6)	100	100	100	100	50	83	50	50	100
Summary Information (6)	83	17	67	83	67	100	67	0	17
MEETING STUDENT NEEDS	percent of needs implemented satisfactorily								
Ease of Use (7)	57	29	43	100	29	43	14	43	100
Adaptability (4)	50	75	50	100	25	50	25	75	100
Testing (3)	0	0	0	100	33	33	33	67	33
Tracking (2)	100	100	50	100	50	100	50	50	50
Interactivity (7)	100	71	57	100	86	57	57	86	86
Appropriateness (18)	72	11	56	94	44	44	61	17	56
SOFTWARE OPERATIONS	percent of attributes implemented satisfactorily								
Reliability (3)	100	100	100	100	100	100	67	100	100
Format (7)	29	29	43	100	14	29	14	43	29

The publisher is shown in parentheses in the list below:

M053 *IBM Math Concepts Level IV* (IBM)
M057 *Math Practice and Problem Solver* (H & N Software)
M059 *Mathematics Exploration Tool Kit* (IBM)
M060 *Mathamath* (VTAE)
M064 *Pre-Algebra* (Price Laboratory School)
M065 *Preparing for Geometry and Algebra* (IBM)
M066 *Principles of Mathematics* (Price Laboratory School)
M068 *Special Topics in Mathematics Series* (Queue, Inc.)
M071 *Pre-Calculus – Kemeny/Kurtz Math Series* (True Basic, Inc.)

Synthesis of Project SYNERGY Reviews for Math

SOFTWARE ID	M073	M075	M087	M088	M090	M091	M092	M093	M096
# of Reviews (up to 3)	1	1	2	1	1	1	3	1	1
INSTRUCTIONAL MODE	Implemented Satisfactorily? Y=yes, N=no, X=mixed								
Drill and Practice	Y	N	Y	Y	Y	N	X	Y	Y
Tutorial	Y	N	Y	Y	Y	Y		Y	Y
Simulation	Y	Y	–	–	–	–	X	–	–
Game	Y	–	–	–	–	Y	Y	–	–
Comprehensive Tool	–	–	–	–	–	–	–	–	–
Partial Tool	Y	Y	Y	–	Y	Y	Y	Y	Y
C O V E R A G E	(Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	percent of objectives implemented satisfactorily								
Base Ten Notation (8)	13	0	0	0	0	0	13	0	0
Basic Ops / Whole Numbers (10)	60	0	0	0	0	0	50	0	0
Prime Numbers & Factorization (4)	100	0	0	0	0	0	0	0	0
Basic Ops / Positive Fractions (19)	68	0	0	0	0	0	11	0	0
Basic Ops / Positive Decimals (13)	62	0	0	0	0	0	0	0	0
Ratio and Proportions (6)	83	50	0	0	0	0	0	0	0
Percents (7)	86	0	0	0	0	0	0	0	0
Units of Measure (10)	100	0	0	0	0	0	0	0	0
Basic Geometry (41)	22	34	0	100	56	0	76	0	0
Basic Ops / Signed Numbers (10)	60	0	0	0	0	0	0	0	0
Real Numbers (25)	0	0	0	0	0	0	0	64	0
Set Notation (7)	0	0	0	0	0	0	0	29	0
Simple Linear Eq. / One Variable (7)	0	0	14	0	0	14	0	100	0
Simple Linear Ineq. / One Variable (6)	0	0	0	0	0	0	0	100	0
Integer Exponents (9)	0	0	0	0	0	11	0	100	56
Polynomials (18)	0	0	0	0	0	28	0	83	33
Factoring (6)	0	0	0	0	0	17	0	100	83
Graphs (21)	0	52	0	0	38	38	0	95	0
Solving Systems of Equations (9)	0	0	0	0	0	0	0	89	0
Quadratics (9)	0	0	0	0	0	33	0	100	44
Rational Expressions (5)	0	0	0	0	0	0	0	100	0
Rational Exponents & Radicals (9)	0	0	0	0	0	0	0	100	0
Geometry (7)	0	71	0	0	43	0	0	14	0
CONTENT ATTRIBUTES	percent of attributes implemented satisfactorily								
Accuracy (3)	100	67	100	100	67	100	100	100	100
Appropriateness (5)	100	40	80	80	40	80	100	100	40
Feedback (3)	67	0	33	33	100	33	0	67	33
MEETING FACULTY NEEDS	percent of needs implemented satisfactorily								
Ease of Implementation (6)	100	83	100	100	100	83	100	100	83
Adaptability (6)	100	83	67	67	83	50	100	100	67
Summary Information (6)	67	100	83	83	83	83	0	67	67
MEETING STUDENT NEEDS	percent of needs implemented satisfactorily								
Ease of Use (7)	43	29	71	29	43	57	71	71	43
Adaptability (4)	75	50	25	0	50	50	25	100	25
Testing (3)	67	33	0	0	67	33	0	67	67
Tracking (2)	100	100	100	0	50	100	0	100	0
Interactivity (7)	86	57	100	29	100	71	57	100	71
Appropriateness (18)	100	72	39	33	11	44	44	56	6
SOFTWARE OPERATIONS	percent of attributes implemented satisfactorily								
Reliability (3)	67	67	100	100	100	100	100	100	100
Format (7)	86	43	29	29	29	43	29	43	29

The publisher is shown in parentheses in the list below.

M073 *Interactive Mathematics* (Ferranti Educational Systems, Inc.)
M075 *Geometry Two: Proofs and Extensions* (IBM)
M087 *Applied Problem Solving* (Educational Activities, Inc.)
M088 *Geometry Area* (Educational Activities, Inc.)
M090 *Microcomputer Curriculum Project Geometry* (Price Laboratory School)
M091 *Algebra Concepts* (Ventura Educational Systems)
M092 *Hands-On Math* (Ventura Educational Systems)
M093 *Computer Tutor for Interm. Algebra: An Applied Approach* (Houghton Mifflin)
M096 *Microcomputer Curriculum Project Algebra I, Vol. 3* (Price Laboratory School)

Table 3.6

Synthesis of Project SYNERGY Reviews for Math

SOFTWARE ID	M098	M099	M100	M103	M104	M106	M107	M115	M116
# of Reviews (up to 3)	1	1	1	2	1	2	1	1	2
INSTRUCTIONAL MODE	Implemented Satisfactorily? Y=yes, N=no, X=mixed								
Drill and Practice	Y	Y	Y	Y	Y	Y	Y	Y	Y
Tutorial	Y	Y	Y	Y	Y	Y	–	Y	Y
Simulation	–	–	–	Y	–	Y	–	–	–
Game	–	–	–	–	–	Y	–	–	–
Comprehensive Tool	Y	–	–	Y	–	–	–	–	–
Partial Tool	Y	–	–	Y	–	Y	Y	Y	Y
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)									
TOPICS	percent of objectives implemented satisfactorily								
Base Ten Notation (8)	0	0	38	0	0	0	50	0	100
Basic Ops / Whole Numbers (10)	0	0	60	0	40	0	60	0	90
Prime Numbers & Factorization (4)	0	0	0	0	75	0	0	0	100
Basic Ops / Positive Fractions (19)	0	0	63	0	11	0	37	0	89
Basic Ops / Positive Decimals (13)	0	0	38	0	0	0	62	0	77
Ratio and Proportions (6)	0	0	50	0	0	0	33	0	83
Percents (7)	0	0	71	0	0	0	0	0	86
Units of Measure (10)	0	0	0	0	0	0	0	0	100
Basic Geometry (41)	0	0	0	0	0	0	0	0	46
Basic Ops / Signed Numbers (10)	0	0	40	80	10	0	60	0	100
Real Numbers (25)	96	0	56	100	0	0	32	12	48
Set Notation (7)	0	0	0	0	0	0	0	0	0
Simple Linear Eq / One Variable (7)	86	0	86	86	43	0	86	0	71
Simple Linear Ineq / One Variable (6)	100	0	0	67	0	0	0	0	17
Integer Exponents (9)	0	0	100	100	0	0	44	100	56
Polynomials (18)	72	28	83	100	0	0	6	28	0
Factoring (6)	33	67	83	83	0	0	0	50	0
Graphs (21)	5	52	48	86	0	81	14	19	19
Solving Systems of Equations (9)	0	56	44	67	0	33	44	56	0
Quadratics (9)	0	89	67	67	0	22	11	78	0
Rational Expressions (5)	0	0	100	100	0	0	0	0	0
Rational Exponents & Radicals (9)	0	78	11	78	0	0	0	67	0
Geometry (7)	0	0	0	0	0	0	0	0	29
CONTENT ATTRIBUTES	percent of attributes implemented satisfactorily								
Accuracy (3)	100	100	100	100	100	100	100	100	100
Appropriateness (5)	100	100	60	100	100	100	80	80	100
Feedback (3)	100	0	0	33	0	100	0	33	100
MEETING FACULTY NEEDS	percent of needs implemented satisfactorily								
Ease of Implementation (6)	83	100	50	83	33	100	83	100	100
Adaptability (6)	67	50	33	67	33	100	100	83	67
Summary Information (6)	0	17	17	67	0	33	17	83	83
MEETING STUDENT NEEDS	percent of needs implemented satisfactorily								
Ease of Use (7)	100	71	43	43	29	100	100	43	71
Adaptability (4)	75	25	25	25	25	100	100	75	75
Testing (3)	33	33	33	0	0	0	100	67	33
Tracking (2)	100	50	50	50	100	50	50	100	100
Interactivity (7)	100	86	86	100	100	86	71	100	100
Appropriateness (18)	61	56	33	61	11	56	56	11	67
SOFTWARE OPERATIONS	percent of attributes implemented satisfactorily								
Reliability (3)	100	100	100	100	100	100	100	100	100
Format (7)	43	29	29	29	29	43	43	29	29

The publisher is shown in parentheses in the list below.

M098 *Algebra I: First Semester* (Britannica Software)
M099 *Algebra: Second Semester* (Britannica Software)
M100 *The Math Lab: Pre-, Beginning, and Intermediate Algebra* (Addison Wesley Publishing Company, Inc.)
M103 *Professor Weissman's Software: Algebra* (Professor Weissman's Software)
M104 *Topics in Algebra* (H & H Publishers)
M106 *The Function Analyzer* (Sunburst Communications)
M107 *PC Solve* (Pacific Crest Software)
M115 *Microcomputer Curriculum Project: Algebra II* (Price Laboratory School)
M116 *Mathcue: Fundamentals of Math* (Saunders College Publishing)

Synthesis of Project SYNERGY Reviews for Math

SOFTWARE ID	M118	M120	M121						
# of Reviews (up to 3)	1	2	1						
INSTRUCTIONAL MODE	Implemented Satisfactorily? Y=yes, N=no, X=mixed								
Drill and Practice	Y	Y	–						
Tutorial	N	Y	Y						
Simulation	–	–	Y						
Game	–	–	–						
Comprehensive Tool	–	–	–						
Partial Tool	–	Y	Y						
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)									
TOPICS	percent of objectives implemented satisfactorily								
Base Ten Notation (8)	0	0	0						
Basic Ops / Whole Numbers (10)	0	10	60						
Prime Numbers & Factorization (4)	0	0	0						
Basic Ops / Positive Fractions (19)	0	0	68						
Basic Ops / Positive Decimals (13)	0	0	15						
Ratio and Proportions (6)	0	0	100						
Percents (7)	0	14	86						
Units of Measure (10)	0	0	100						
Basic Geometry (41)	0	0	63						
Basic Ops / Signed Numbers (10)	0	70	60						
Real Numbers (25)	0	72	20						
Set Notation (7)	0	0	0						
Simple Linear Eq. / One Variable (7)	57	100	71						
Simple Linear Ineq. / One Variable (6)	50	67	0						
Integer Exponents (9)	0	100	56						
Polynomials (18)	44	94	0						
Factoring (6)	100	100	0						
Graphs (21)	67	81	0						
Solving Systems of Equations (9)	67	67	0						
Quadratics (9)	22	89	11						
Rational Expressions (5)	0	100	0						
Rational Exponents & Radicals (9)	0	56	0						
Geometry (7)	0	14	29						
CONTENT ATTRIBUTES	percent of attributes implemented satisfactorily								
Accuracy (3)	100	100	0						
Appropriateness (3)	100	100	0						
Feedback (3)	100	100	0						
MEETING FACULTY NEEDS	percent of needs implemented satisfactorily								
Ease of Implementation (6)	83	100	67						
Adaptability (6)	67	100	100						
Summary Information (6)	0	50	100						
MEETING STUDENT NEEDS	percent of needs implemented satisfactorily								
Ease of Use (7)	43	43	14						
Adaptability (4)	25	75	50						
Testing (3)	0	33	0						
Tracking (2)	100	100	50						
Interactivity (7)	100	100	86						
Appropriateness (18)	33	67	56						
SOFTWARE OPERATIONS	percent of attributes implemented satisfactorily								
Reliability (3)	100	100	100						
Format (7)	29	29	43						

The publisher is shown in parentheses in the list below.

M118 *Mathcat Solution Finder* (Saunders College Publishing) **M121** *Everyday Mathematics* (Degem Systems, Ltd.)

M120 *Mathcat Basic Algebra* (Saunders College Publishing)

Synthesis of Project SYNERGY Reviews for ESL

SOFTWARE ID	E002	E003	E004	E005	E006	E008	E010	E013
# of Reviews (up to 3)	1	2	2	2	1	1	1	1
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	–	Y	Y	Y	–	Y	Y	–
Tutorial	Y	Y	Y	–	–	Y	Y	Y
Simulation	–	–	–	–	–	–	–	–
Game	–	–	Y	Y	Y	–	Y	–
Comprehensive Tool	–	–	–	–	–	–	–	–
Partial Tool	Y	Y	Y	Y	Y	–	Y	Y
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Reading:								
Word Learning (26)	73	0	0	0	27	0	46	8
Literal Comprehension (20)	100	0	0	0	5	0	25	0
Critical Comprehension (18)	17	0	0	0	0	0	0	0
Functional Skills (21)	33	0	0	0	5	0	0	0
Writing:								
Words/Phrases (51)	0	35	4	8	0	16	4	51
Sentences (40)	0	0	73	15	0	8	0	5
Paragraphs (30)	0	0	0	0	0	0	0	0
Essays (13)	0	0	0	0	0	0	0	0
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	100	100	100	100	100	100
Appropriateness (5)	80	100	100	100	100	100	60	100
Feedback (3)	0	100	33	33	0	33	100	100
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	33	100	100	100	83	100	83	83
Adaptability (6)	50	100	100	100	67	67	67	33
Summary Information (6)	33	100	83	83	67	83	67	50
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease of Use (7)	43	57	57	71	29	29	43	43
Adaptability (4)	25	50	75	100	50	0	25	100
Testing (3)	0	33	33	0	33	33	67	0
Tracking (2)	0	100	100	100	100	100	100	100
Interactivity (7)	0	100	100	100	29	71	57	100
Appropriateness (18)	22	50	50	56	50	11	6	56
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliability (3)	100	100	100	100	100	100	100	100
Format (7)	14	43	43	43	29	43	29	29

The publisher is shown in parentheses in the list below:

E002 *Culturgrams* (ICD Corporation)
E003 *Diagnostic Prescriptive Grammar* (Merit Audio Visual)
E004 *Writing Demons (5–8)* (Merit Audio Visual)
E005 *Sensible Sentence Master* (Merit Audio Visual)
E006 *Synonym, Antonym and Analogy Puzzle Series A* (Merit Audio Visual)
E008 *Tutorcourse BLS 200G, Grammar 200* (BLS)
E010 *Vocabulary Mastery II for Business* (American Language Academy)
E013 Conversational Demos (Merit Audio Visual)

Synthesis of Project SYNERGY Reviews for ESL

SOFTWARE ID	E027	E030	E031	E032	E033	E034	E035	E036
# of Reviews (up to 3)	2	1	1	1	1	1	1	1
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	Y	–	Y	Y	Y	–	–	–
Tutorial	Y	–	Y	Y	Y	Y	Y	Y
Simulation	–	–	–	–	–	–	–	–
Game	–	Y	–	–	Y	–	–	–
Comprehensive Tool	–	–	–	–	–	–	–	–
Partial Tool	Y	Y	Y	Y	Y	–	–	–
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Reading:								
Word Learning (26)	0	15	46	35	54	–	0	–
Literal Comprehension (20)	0	0	20	35	40	–	0	–
Critical Comprehension (18)	0	0	0	0	0	–	0	–
Functional Skills (21)	0	0	19	29	29	–	10	–
Writing:								
Words/Phrases (51)	0	0	39	63	35	–	0	–
Sentences (40)	13	0	15	38	20	–	0	–
Paragraphs (30)	0	0	0	0	0	–	0	–
Essays (13)	0	0	0	0	0	–	0	–
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	100	100	100	100	100	67
Appropriateness (5)	100	100	80	100	80	100	60	80
Feedback (3)	100	33	100	100	100	33	33	0
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	83	83	83	50	83	67	83	67
Adaptability (6)	50	67	67	67	67	50	33	17
Summary Information (6)	50	50	17	67	33	17	33	0
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease of Use (7)	43	43	43	43	29	14	57	14
Adaptability (4)	100	75	25	75	50	25	0	0
Testing (3)	100	0	33	33	100	0	0	0
Tracking (2)	100	100	50	50	50	0	0	0
Interactivity (7)	100	100	86	100	100	43	86	57
Appropriateness (18)	33	72	28	61	61	61	61	22
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliability (3)	100	100	100	100	100	100	67	100
Format (7)	43	29	29	29	29	71	71	71

The publisher is shown in parentheses in the list below:

E027 *Punctuate* (All-Write)
E030 *Synonym, Antonym and Analogy Puzzle Series C* (Merit Audio Visual)
E031 *Grammar Masters II Series A* (American Language Academy)
E032 *Grammar Masters II Series B* (ALA)
E033 *Grammar Masters II Series C* (ALA)
E034 *Talk to Me* (Educational Activities, Inc.) (This program covers speaking topics.)
E035 *Quick Talk* (Educational Activities, Inc.) (This program covers speaking topics.)
E036 *Conversations* (Educational Activities, Inc.) (This program covers speaking topics.)

Table 4.2

Synthesis of Project SYNERGY Reviews for ESL

SOFTWARE ID	E039	E052	E053	E054	E059	E062	E066	E067
# of Reviews (up to 3)	1	1	1	1	1	1	1	1
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	Y	Y	Y	Y	–	–	–	–
Tutorial	Y	Y	Y	Y	Y	Y	Y	Y
Simulation	–	–	–	–	–	–	–	–
Game	–	–	–	–	–	–	–	–
Comprehensive Tool	–	–	–	–	–	–	–	–
Partial Tool	Y	–	Y	Y	–	–	–	–
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Reading:								
Word Learning (26)	0	0	0	0	38	38	38	38
Literal Comprehension (20)	0	0	0	0	35	45	50	45
Critical Comprehension (18)	0	0	0	0	39	39	0	0
Functional Skills (21)	0	0	0	0	0	5	0	0
Writing:								
Words/Phrases (51)	43	41	16	14	0	0	0	0
Sentences (40)	28	0	50	30	0	0	0	0
Paragraphs (30)	17	0	0	0	0	0	0	0
Essays (13)	0	0	0	0	0	0	0	0
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	100	100	100	100	100	100
Appropriateness (5)	100	100	100	100	100	100	100	100
Feedback (3)	100	33	33	0	100	100	33	33
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	100	17	17	17	100	100	100	100
Adaptability (6)	33	17	17	17	33	33	67	67
Summary Information (6)	67	0	0	0	83	83	83	83
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease of Use (7)	29	29	29	29	14	29	100	100
Adaptability (4)	75	25	25	25	25	25	75	75
Testing (3)	67	0	0	0	67	67	100	100
Tracking (2)	100	50	50	50	100	100	50	50
Interactivity (7)	100	86	86	86	100	100	100	100
Appropriateness (18)	78	28	28	28	11	11	11	11
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliability (3)	100	100	100	100	100	100	100	100
Format (7)	29	14	14	14	43	29	43	29

The publisher is shown in parentheses in the list below:

E039 *Diascriptive Language Arts Development* (Educational Activities, Inc.)
E052 *The COMPress ESL Program: A* (Queue, Inc.)
E053 *The COMPress ESL Program: B* (Queue, Inc.)
E054 *The COMPress ESL Program: C* (Queue, Inc.)
E059 *CLOZE - PLUS II Level 5* (Instructional Communications Technology)
E062 *CLOZE - PLUS II Level 8* (Instructional Communications Technology)
E066 *Reading Around Words Set G Level 7* (Instructional Communications Technology)
E067 *Reading Around Words Set H Level 8* (Instructional Communications Technology)

Synthesis of Project SYNERGY Reviews for ESL

SOFTWARE ID	E080	E083	E087	E089	E090	E091	E092	E093
# of Reviews (up to 3)	1	1	1	1	1	1	1	1
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	–	–	Y	Y	Y	Y	Y	Y
Tutorial	Y	Y	–	Y	–	–	Y	–
Simulation	–	–	–	–	–	–	–	–
Game	–	–	–	Y	Y	–	–	–
Comprehensive Tool	–	–	–	–	–	–	–	–
Partial Tool	–	–	Y	Y	Y	Y	Y	Y
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Reading:								
Word Learning (26)	0	0	0	15	15	0	0	0
Literal Comprehension (20)	100	80	0	0	0	0	0	0
Critical Comprehension (18)	44	50	0	0	0	0	0	0
Functional Skills (21)	14	0	0	0	24	0	0	0
Writing:								
Words/Phrases (51)	0	0	0	22	18	8	29	4
Sentences (40)	0	0	0	0	0	20	13	8
Paragraphs (30)	0	0	40	0	0	0	0	13
Essays (13)	0	0	0	0	0	0	0	23
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	100	100	100	100	100	100
Appropriateness (5)	100	100	100	100	80	80	100	100
Feedback (3)	33	33	33	100	0	0	33	33
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	100	100	83	83	83	33	100	83
Adaptability (6)	33	50	17	33	83	17	67	17
Summary Information (6)	83	83	83	67	67	0	83	83
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease of Use (7)	29	29	29	43	14	57	29	29
Adaptability (4)	25	25	50	100	25	25	50	50
Testing (3)	100	100	33	0	0	0	33	33
Tracking (2)	50	50	50	100	100	50	100	50
Interactivity (7)	86	86	100	86	57	71	86	100
Appropriateness (18)	11	11	22	11	28	11	11	22
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliability (3)	100	100	100	100	100	100	100	100
Format (7)	29	29	29	29	14	29	43	29

The publisher is shown in parentheses in the list below:

E080 *Comprehension Power Program Set CP-I: Level 6* (Instructional Communications Technology)
E083 *Comprehension Power Program Set CP-I: Level 9* (Instructional Communications Technology)
E087 *Basic Composition: Paragraphs* (Queue, Inc.)
E089 *English Basics* (Educational Activities, Inc.)
E090 *Sortset* (Research Design Associates, Inc.)
E091 *Vistas: Level 3* (Jostens Learning)
E092 *Tutorcourse BLS 3000* (BLS)
E093 *Basic English Composition* (Queue, Inc.)

Table 4.4

Synthesis of Project SYNERGY Reviews for ESL

SOFTWARE ID	E094	E095	E096	E098	E099	E101	E106	E108
# of Reviews (up to 3)	1	1	1	1	1	1	1	1
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	Y	Y	Y	Y	Y	Y	Y	–
Tutorial	–	–	–	Y	Y	Y	–	–
Simulation	–	–	–	–	–	–	–	–
Game	–	–	–	Y	Y	–	–	Y
Comprehensive Tool	–	–	–	–	–	–	–	–
Partial Tool	Y	Y	Y	Y	Y	Y	Y	Y
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Reading:								
Word Learning (26)	0	0	0	19	35	31	0	0
Literal Comprehension (20)	0	0	0	30	35	80	0	0
Critical Comprehension (18)	0	0	0	0	0	22	0	0
Functional Skills (21)	0	0	0	14	14	0	0	0
Writing:								
Words/Phrases (51)	20	10	16	0	0	0	22	2
Sentences (40)	25	18	45	0	0	0	28	0
Paragraphs (30)	0	0	0	0	0	0	0	0
Essays (13)	0	0	0	0	0	0	0	0
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	100	100	100	100	100	100
Appropriateness (5)	80	80	80	80	80	60	80	100
Feedback (3)	0	0	0	100	100	100	0	67
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	33	33	33	83	83	83	33	67
Adaptability (6)	17	17	17	67	67	67	17	83
Summary Information (6)	0	0	0	83	83	0	0	0
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease of Use (7)	57	57	57	71	71	57	57	29
Adaptability (4)	25	25	25	50	50	25	25	75
Testing (3)	0	0	0	0	0	33	0	0
Tracking (2)	50	50	50	100	100	100	50	0
Interactivity (7)	71	71	71	86	100	86	71	100
Appropriateness (18)	11	11	11	28	28	11	11	78
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliability (3)	100	100	100	100	100	100	100	100
Format (7)	29	29	29	29	29	14	29	29

The publisher is shown in parentheses in the list below:

E094 *Vistas: Level 7* (Jostens Learning)
E095 *Vistas: Level 9* (Jostens Learning)
E096 *Vistas: Level 11* (Jostens Learning)
E098 *Vocabulary Mastery Set A* (American Language Academy)
E099 *Vocabulary Mastery Set B* (American Language Academy)
E101 *Maths Magic & Monsters* (Educational Design, Inc.)
E106 *Vistas: Level 5* (Jostens Learning)
E108 *Lucky 7 Spelling Games* (Queue, Inc.)

Synthesis of Project SYNERGY Reviews for Study Skills/Critical Thinking

SOFTWARE ID	C001	C003	C004	C006	C007	C013	C014	C015
# of Reviews (up to 3)	1	1	1	1	1	1	2	1
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	Y	Y	Y	–	Y	–	–	–
Tutorial	Y	Y	Y	Y	Y	N	Y	Y
Simulation	–	–	–	Y	Y	–	Y	–
Game	–	–	–	–	–	–	–	–
Comprehensive Tool	–	–	–	N	–	–	–	–
Partial Tool	Y	–	–	–	Y	N	Y	Y
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Personal Behaviors (35)	0	0	0	6	0	11	3	14
Study Behaviors (15)	0	0	27	33	13	0	0	27
Classroom Behaviors (26)	58	0	0	0	15	0	8	15
Critical Thinking (39)	0	56	23	13	0	0	36	0
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	100	100	100	100	100	100
Appropriateness (5)	100	100	100	100	80	80	100	60
Feedback (3)	100	100	100	33	100	33	100	100
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	83	100	83	83	83	83	100	83
Adaptability (6)	100	67	33	67	100	33	67	67
Summary Information (6)	0	0	0	0	0	33	33	33
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease (7)	100	57	100	71	100	29	57	29
Adaptability (4)	75	25	75	50	100	75	75	75
Testing (3)	0	0	0	33	0	0	67	67
Tracking (2)	0	0	0	0	0	100	100	50
Interactivity (7)	86	100	100	86	86	86	100	71
Appropriateness (18)	33	33	33	56	78	6	33	22
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliability (3)	100	100	100	100	100	100	100	100
Format (7)	29	29	29	14	29	29	29	29

The publisher is shown in parentheses in the list below:

C001 *Test Taking* (Indiana University Learning Skills Center)

C003 *Writing Learning Logs* (Indiana University Learning Skills Center)

C004 *Summary Writing* (Indiana University Learning Skills Center)

C006 *How to Read Biology* (Indiana University Learning Skills Center)

C007 *Textbook Marking* (Indiana University Learning Skills Center)

C013 *Test Taking Made Easy* (MCE Lawrence Production)

C014 *Following Directions* (MCE Lawrence Production)

C015 *Study Skills* (MCE Lawrence Production)

Table 5.1

Synthesis of Project SYNERGY Reviews for Study Skills/Critical Thinking

SOFTWARE ID	C016	C017	C018	C021	C022	C023	C026	C027
# of Reviews (up to 3)	1	1	1	2	2	1	1	1
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice				Y	Y	Y	Y	Y
Tutorial	Y	Y	Y	Y	Y	Y	Y	Y
Simulation								
Game								
Comprehensive Tool							Y	
Partial Tool	Y	Y	Y	Y	Y	Y		Y
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Personal Behaviors (35)	49	14	0	0	31	0	0	0
Study Behaviors (15)	60	13	40	60	0	0	0	0
Classroom Behaviors (26)	38	73	8	0	0	0	0	0
Critical Thinking (39)	0	0	0	0	69	15	92	92
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	100	100	100	100	100	67
Appropriateness (5)	100	60	60	100	100	100	100	80
Feedback (3)	100	100	100	100	100	0	100	100
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	100	67	67	100	100	100	67	50
Adaptability (6)	50	67	67	100	100	83	100	100
Summary Information (6)	50	0	0	83	83	67	100	83
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease (7)	29	29	29	71	43	43	29	43
Adaptability (4)	75	50	75	100	100	100	100	75
Testing (3)	33	67	67	67	0	0	0	0
Tracking (2)	50	100	50	100	100	100	100	50
Interactivity (7)	86	43	14	100	86	57	86	100
Appropriateness (18)	39	33	11	56	33	11	28	28
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliabilty (3)	100	100	67	100	100	100	100	67
Format (7)	29	29	29	43	29	29	43	14

The publisher is shown in parentheses in the list below:

C016 *Study To Succeed* (MCE Lawrence Production)

C017 *Skills for Successful Test Taking* (MCE Lawrence Production)

C018 *Building Memory Skills* (MCE Lawrence Production)

C021 *GUIDES: Reading and Study Skills* (Educational Testing Service)

C022 *Developing Critical Thinking Skills for Effective Reading: Set 1* (Merit Audio Visual)

C023 *Developing Critical Thinking Skills for Effective Reading: Set 2* (Merit Audio Visual)

C026 *Reading and Critical Thinking* (Queue Inc.)

C027 *Reading Critically for Upper Grades* (Merit Audio Visual)

Synthesis of Project SYNERGY Reviews for Study Skills/Critical Thinking

SOFTWARE ID	C028	C029	C030	C031	C034	C041	C042	C043
# of Reviews (up to 3)	2	1	1	1	1	1	1	1
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	Y	Y	Y	Y	Y	–	–	Y
Tutorial	Y	Y	Y	Y	Y	Y	Y	–
Simulation	–	–	Y	–	–	Y	–	–
Game	–	–	–	–	–	–	–	–
Comprehensive Tool	–	–	Y	–	–	Y	–	–
Partial Tool	Y	Y	–	Y	–	–	–	Y
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Personal Behaviors (35)	6	17	0	0	0	0	0	–
Study Behaviors (15)	0	0	0	0	7	0	0	–
Classroom Behaviors (26)	0	0	0	0	4	0	0	–
Critical Thinking (39)	79	51	100	10	3	59	49	–
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	100	100	100	100	100	100
Appropriateness (5)	100	100	100	100	100	100	100	60
Feedback (3)	100	33	100	33	100	100	0	67
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	100	100	83	0	83	83	100	100
Adaptability (6)	100	67	100	0	100	100	100	67
Summary Information (6)	83	100	100	0	83	50	83	100
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease (7)	43	43	43	29	43	43	43	71
Adaptability (4)	100	100	100	75	100	100	75	50
Testing (3)	0	33	33	0	100	67	0	67
Tracking (2)	100	100	100	100	100	100	100	100
Interactivity (7)	100	71	100	71	100	100	100	86
Appropriateness (18)	33	11	33	11	33	56	11	28
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliabilty (3)	100	100	100	67	100	100	100	100
Format (7)	29	29	43	29	43	29	43	100

The publisher is shown in parentheses in the list below:

C028 *Reading Non-Fiction Critically for Upper Grades 6-9 - 9.0* (Merit Audio Visual)

C029 *Analogies* (Queue, Inc.)

C030 *Lessons in Reading and Reasoning 9.0 - 14.0* (Queue, Inc.)

C031 *Analogies College Bound 11.0 - 12.0* (Hartley Courseware)

C034 *Skills Bank II: Study Skills* (Skills Bank Corporation)

C041 *The Problem Solving Toolbox* (C & D Computer Enterprises, Inc.)

C042 *Idegen - -* (Finn Trade)

C043 *Reading Strategies* (EDL) (This program focuses on vocabulary and reading rate, which are not covered in the topics in this table.)

Synthesis of Project SYNERGY Reviews for Study Skills/Critical Thinking

SOFTWARE ID	C047	C048	C050	C051	C052	C053	C055	C056
# of Reviews (up to 3)	2	3	1	1	1	2	2	2
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	–	–	–	Y	Y	–	–	–
Tutorial	–	–	Y	Y	Y	–	–	–
Simulation	Y	Y	Y	Y	–	Y	Y	Y
Game	Y	–	Y	Y	–	Y	Y	Y
Comprehensive Tool	Y	–	–	Y	–	Y	Y	Y
Partial Tool	–	–	Y	–	–	–	–	–
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Personal Behaviors (35)	49	46	0	20	0	51	49	51
Study Behaviors (15)	0	0	13	53	47	0	0	0
Classroom Behaviors (26)	12	15	0	23	42	12	12	12
Critical Thinking (39)	95	97	21	74	0	97	95	92
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	100	100	100	100	100	100
Appropriateness (5)	100	100	80	100	100	100	100	100
Feedback (3)	0	0	100	33	33	0	33	0
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	100	100	67	83	50	100	100	100
Adaptability (6)	83	50	67	67	50	67	83	67
Summary Information (6)	50	33	0	83	17	67	50	67
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease (7)	100	100	29	71	0	100	100	100
Adaptability (4)	100	100	25	100	25	100	100	100
Testing (3)	0	0	67	0	33	0	0	0
Tracking (2)	100	0	0	50	0	100	100	100
Interactivity (7)	57	57	86	86	100	57	57	57
Appropriateness (18)	56	56	78	28	33	56	56	56
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliabilty (3)	100	100	100	100	100	100	100	100
Format (7)	43	43	29	43	14	43	43	43

The publisher is shown in parentheses in the list below:

C047 *Decisions, Decisions: Environment* (Tom Snyder Productions)

C048 *Decisions, Decisions: Television* (Tom Snyder Productions)

C050 *SOS: Strategies for Problem Solving* (C & D Computer Enterprises, Inc.)

C051 *Reading and Study Skills: Forms A & B* (McGraw-Hill)

C052 *Read/Write Software to Accompany McWhorter* (Harper Collins)

C053 *Decisions, Decisions: Prejudice* (Tom Snyder Productions)

C055 *Decisions, Decisions: Substance Abuse* (Tom Snyder Productions)

C056 *Decisions, Decisions: Urbanization* (Tom Snyder Productions)

Synthesis of Project SYNERGY Reviews for Study Skills/Critical Thinking

SOFTWARE ID	C058	C059	C060	C062				
# of Reviews (up to 3)	1	1	1	1				
INSTRUCTIONAL MODE	**Implemented Satisfactorily? Y=yes, N=no, X=mixed**							
Drill and Practice	–	Y	–	–				
Tutorial	–	Y	–	–				
Simulation	Y	–	–	Y				
Game	–	–	–	–				
Comprehensive Tool	N	–	–	Y				
Partial Tool	–	Y	Y	–				
C O V E R A G E (Numbers in parentheses represent the number of objectives/attributes.)								
TOPICS	**percent of objectives implemented satisfactorily**							
Personal Behaviors (35)	26	0	6	37				
Study Behaviors (15)	0	0	0	0				
Classroom Behaviors (26)	12	0	0	12				
Critical Thinking (39)	92	13	0	92				
CONTENT ATTRIBUTES	**percent of attributes implemented satisfactorily**							
Accuracy (3)	100	100	100	100				
Appropriateness (3)	100	100	0	100				
Feedback (3)	0	100	33	0				
MEETING FACULTY NEEDS	**percent of needs implemented satisfactorily**							
Ease of Implementation (6)	100	100	83	100				
Adaptability (6)	33	83	17	50				
Summary Information (6)	50	67	50	50				
MEETING STUDENT NEEDS	**percent of needs implemented satisfactorily**							
Ease (7)	71	43	57	71				
Adaptability (4)	75	100	25	50				
Testing (3)	0	0	0	0				
Tracking (2)	100	100	50	100				
Interactivity (7)	57	57	43	57				
Appropriateness (18)	56	28	11	56				
SOFTWARE OPERATIONS	**percent of attributes implemented satisfactorily**							
Reliabilty (3)	100	100	100	100				
Format (7)	43	29	29	43				

The publisher is shown in parentheses in the list below:

C058 *Decisions, Decisions: Campaign Trail* (Tom Snyder Productions)

C059 *Reading Non-Fiction Critically* (Merit Audio Visual)

C060 *Winning at Math* (Academic Success Press)

C062 *Decisions, Decisions: Foreign Policy* (Tom Snyder Productions)

Project SYNERGY Software Selector PS³

Project SYNERGY Software Selector, or PS³, is an intelligent software program that helps faculty match up their individualized instructional needs with titles of IBM and IBM-compatible basic-skills software packages reviewed in Project SYNERGY. The PS³ database currently includes titles of 259 software packages in reading, writing, math, ESL, and study skills/critical thinking, i.e., all those listed on ISAAC as shown in the previous syntheses. The current release of PS³ is the second version. PS³ will continue to be updated periodically as new titles are added.

Using the faculty-developed Project SYNERGY learning objectives for each discipline, as well as the software attributes common to all disciplines, PS³ searches the database to determine which software titles match the objectives and attributes selected by the user (see Appendix B for a complete list of objectives and attributes). With a series of pulldown menus, the user first sets the **criteria** for PS³ to use to search the database.

Under **User Preference**, the user specifies the following criteria:

Discipline — Reading, Writing, Mathematics, ESL, Study Skills/Critical Thinking.

Level of Content Matching — Whole Program, Topics/Subtopics, Individual Objectives.

Computer Environment — Networked, Standalone, Either.

Instructional Mode — Drill & Practice, Tutorial, Simulation, Game, Comprehensive or Partial Tool.

Minimum Acceptable Objectives Score — Percentage score for objectives "Implemented Satisfactorily."

Minimum Acceptable Attributes Score — Percentage score for objectives "Implemented Satisfactorily."

Under **Topics and Objectives**, the user specifies which topics/subtopics or individual objectives PS³ should search for in selecting software titles. Under **Attributes**, the user specifies the weight — on a scale of 0-10 — to give to each of the software attributes. The user may also choose to use the default weights, which represent the average of all faculty reviewers who responded that groups of attributes "Should Be Present."

After the search criteria have been specified, the user may instruct PS³ to search the database. PS³ will then display a list, ranked by percentage score for the objectives implemented satisfactorily, of the software titles that meet the user's criteria. PS³ can also search the titles in the database for a match on one or more keywords. The user may elect to see the complete review information for any software title by clicking on it. That information will include the following:

Software: Title, Author, Version, Operating Environment.

Publisher: Name, Address, Telephone Number(s).

Reviewer(s) (up to three): Name, Address.

Objectives: For each objective, the number of reviewers who said the objective is "Implemented Satisfactorily" and the number who said it is not.

Attributes: For each attribute, the number of reviewers who said the attribute "Actually Is Present" and the number who said it is not.

PS³ can print the list of matched software, the complete review information on any selected software title, and a complete list of information on the software publishers.

Miami-Dade Community College now markets PS³ on a national scale. For information or a brochure, call or write:

Miami-Dade Community College
Product Development & Distribution
11011 SW 104 St. • Miami, FL 33176-3393
(305) 237-2158 • Fax: (305) 237-2928

Mastery Testing

From the start of Project SYNERGY (and even prior to that as this project was conceptualized), faculty have stressed the need for a bank of questions and items to be available in Project SYNERGY Integrator (PSI) to test students' mastery of Project SYNERGY learning objectives, and to do so independently of post-testing that may be available within individual instructional software packages. To that end, Project SYNERGY II has made the production of a bank of mastery test items a key activity.

Faculty teams in reading, writing, and mathematics have been writing questions for Project SYNERGY Testbank and reviewing them for quality and validity. Additionally, the reading faculty have been selecting and creating reading passages upon which some comprehension questions are based, while the writing faculty have been developing writing topics in place of creating questions for learning objectives that do not lend themselves to multiple-choice testing. At the start of this activity in 1992, the project team prepared and distributed an extensive set of guidelines and sample questions for question writers/reviewers to follow.

Three Discipline Coordinators at Miami-Dade (for reading, Don Meagher; for writing, Melinda Prague; for mathematics, Norma Agras) are responsible for helping faculty authors to reserve objectives for which to write questions, sending the completed items out to other question writers for review, and ultimately accepting (or rejecting) the questions for Project SYNERGY Testbank. The Testbank Coordinator at Miami-Dade (Lorne Kotler) is responsible for getting the questions and items entered into **BANQUE**, Miami-Dade's computerized testbank system that will generate mastery tests under PSI.

The goal is to have a minimum of ten questions per objective for a total across the three disciplines of more than 5,000 items. Questions are classified in the Testbank according to **Difficulty Level** (low college prep, high college prep, college level) and **Thinking Skill** (factual, comprehension, application). To manage the process of reserving, writing, reviewing (twice, if necessary), and accepting items, the project team developed a special computerized tracking program for the Discipline Coordinators in their faculty offices; entering of the items into the actual Testbank is done at the project team's office. Question reliability will be verified in the Project SYNERGY Centers for Software Implementation (CSI's).

Since mid-1992, approximately twenty question writers/reviewers have been active across the Project SYNERGY institutions and have produced (as of July 1993) 700 questions and items. Faculty claim that the process of writing and reviewing questions in this project has helped them to *improve their questions*. Now we will be stepping up our pace considerably to complete the bank of mastery test items for Project SYNERGY Integrator. Also, we intend to seek further funding in order to expand the process to include ESL and study skills/critical thinking.

Part Two: Software Implementation Studies

We are very pleased to present the studies conducted at three SYNERGY Centers: Miami-Dade Community College, North Campus; Bakersfield College in California; and Miami-Dade Community College, Wolfson Campus. While the North Campus began its implementation in 1991 and has completed four replication studies, the other two have just completed their pilot studies using DESKlab. The problem of basic-skills deficiencies among college students is equally felt at all three SYNERGY Centers and the concern of faculty to address this problem is equally strong. The faculty who participated in the studies have expressed their beliefs in the potential of technology to help their students, as well as their disappointments at the outcomes' not matching their expectations. In spite of their disappointments, they continue to explore better ways to incorporate technology in the teaching/learning process.

These faculty are not alone in experiencing a gap between expectations and outcomes when it comes to using technology to improve learning. What is unique about them is that they are doing something to reduce this gap by engaging in research and replicating their studies as they modify what they do and how they do it. This is where Project SYNERGY'S Software Implementation Model (page 43) provides a structure for faculty to consider research as a vehicle for change and improvement.

We salute the faculty for their contribution to the Project SYNERGY Software Implementation Studies. The North Campus report includes a synthesis of criteria from all the studies conducted across four semesters, and the other two reports each include the candid observations of the research coordinators, Greg Chamberlain, Bakersfield College, and George Alexander, Wolfson Campus. We are grateful to both of them for nurturing the faculty on the one hand and for looking in from the outside relative to what factors facilitate or debilitate the use of technology to improve learning.

Following the case studies of these three SYNERGY Centers are some observations by the Software Implementation Designers for two upcoming SYNERGY Centers — Lolita W. Gilkes for Richland College (Dallas Community College District) and Polly Glover for the University of Tennessee at Martin.

Miami-Dade Community College North Campus SYNERGY Center

Kamala Anandam
Project SYNERGY Director
Miami-Dade Community College

VictorNwankwo
Project SYNERGY
Software Implementation Coordinator
Miami-Dade Community College

Information about North Campus

Located on a 245-acre site in the Opa-Locka area of Dade County, North Campus is the College's oldest campus. North campus personnel are fond of pointing out that "it all began here."

North Campus offers more occupational and technical programs than do the other campuses. Most of Dade County's police and fire-safety personnel are trained here. It houses the only program for funeral directors in the state. Its commercial and graphic arts programs are recognized as the most comprehensive and best-equipped in the county. Recently, a program in film-production technology was developed to support the fledgling South Florida film industry.

In Fall Term 1992, North Campus enrolled 16,330 credit students or 30% of the total student body at Miami-Dade. A majority were women (58%) and part-timers (61%). About one-fourth were over 30 years of age. Because of its location, North Campus has offered a ready access point to higher education for many minority students. In Fall Term 1992, a majority of North Campus students were minorities — 44% were Hispanic and 39% were Black non-Hispanic. Most new students arrived academically underprepared (69%) or needed to start with English as a Second Language (ESL) courses (13%).

SYNERGY Center Studies

The North Campus of Miami-Dade Community College was the first to become a SYNERGY Center in June 1990. Since then, studies have been conducted with several courses across four major terms, and their results are presented in the following pages. Rather than provide case studies of individual faculty members, we plan to provide some information about how the research studies were designed and to explain the trends we see emerging from these studies.

Project SYNERGY's Software Implementation Model served as a guide for our research studies (see Figure 1 on page 43). The model encourages the faculty to rely on their own *internal frame of reference* to come up with personally meaningful reasons for using software and evaluating the outcomes. The model emphasizes the need for replicating the studies (the spiral in Figure 1) in the context of formative evaluation in order for faculty to modify and refine the ways in which they use

software until the desired outcomes are achieved. Stated differently, the iterative nature of the *accommodation assimilation cycle* permits the faculty to take steps small enough to insure their personal success and comfort while they refine their implementations.

We began with nine faculty — two in reading, four in writing, and three in math. Three stopped with the first study and one joined the group in the second. The results presented in the following pages pertain to these ten faculty across four semesters. *Currently, thirteen faculty, including seven from the original group, are using the SYNERGY Center.*

The Software Implementation Model did not enjoy the same degree of success among the ten faculty. Their personal software implementation models were more like those shown in Figure 2.

Figure 1. Software Implementation Model

Figure 2. Personal Software Implementation Models

The dangers of quitting too soon because the results are not spectacular and/or settling down to a routine when the results are not quite convincing are real dangers in action research. Can they be avoided? Yes, but only if the faculty are willing to examine the research outcomes carefully and refine their methodologies prior to replicating their studies.

When we began in 1990, the SYNERGY Center was presented to the students as an "open lab" for them to drop in at their convenience to meet the required lab hours for the course and to spend more time if they wished. During the later studies, in addition to some open time, lab hours have been scheduled for the students when either their faculty conduct classes in the SYNERGY Center or tutors assist the students. At present, the faculty seem to prefer open lab or scheduled hours with tutors.

Although we used experimental and control groups as our basic research design, we were unable to assign students randomly to either experimental or control groups; we could assign only intact classes to these groups, which meant

that the groups were not comparable at the beginning of the semester in terms of "repeating the course." Also, we were unable to control the experimental variations systematically because faculty were interested in trying different combinations within the same semester. In some instances, there was no "pure" experimental group since faculty allowed their students to use both the SYNERGY Center and the traditional lab. In action research, these difficulties are inevitable. We do acknowledge the inconsistencies in the results and intend to go beyond individual studies to see what we can learn. In examining all the studies, we have tried to identify the indicators which point to the benefits, both educational and economic, and to include some ideas for future research.

Prior to enumerating the indicators, let us mention that we owe these faculty a debt of gratitude for charting the course toward educational accountability. The fact that they continue to use the SYNERGY Center for more and more of their students, that they are experimenting with various combinations of human and technological resources, and that the Department of Basic Communication Studies has acquired an ownership of the lab is the best indicator of the usefulness of the SYNERGY Center.

SYNERGY Center Benefit Indicators

- When students were given a choice to use either the SYNERGY Center or the traditional lab, they tended to go to the latter or to neither. In the use instances, they did not succeed as well as when they were *required* to use the SYNERGY Lab (Reading Instructor 1, Study 2; Math Instructor 1, Study 3). It makes sense, therefore, to *require* these students to participate in the SYBERGY Lab.
- In the case of research studies where the first study yielded better results than the later ones (Writing Instructor 1, Reading Instructor 1, Math Instructor 1), the faculty need to examine how the use of the software could be reorganized from one term to another. It is quite possible that the students coming to college are different from one term to another, a phenomenon which would warrant adjustments.
- In the case of CSR and PLATO, another way to look at the more positive results first time around is to examine the relative contributions and optimal balance of faculty's teaching in a traditional classroom setting, students' working in the SYNERGY Center as an open lab, and the faculty's holding their classes in the SYNERGY Center (Writing Instructor 1, Studies 2 and 3; Writing Instructor 2, Studies 2 and 3). The presence of faculty in the SYNERGY Center when students are going through drill and practice at the computer does not seem to help.
- On the other hand, scheduling specific hours for the students to use the SYNERGY Lab when a tutor is also present seems to hold promise for reducing the dropout rates and increasing the success rates. In this situation, each student is able to work with his/her own computerized personal tutor and also receive the personal touch and encouragement from a human tutor when necessary (Writing Instructor 1, Study 4; Writing Instructor 2, Study 4; Reading Instructor 2, Studies 1 and 2). This particular method is likely to yield some economic benefits as well when compared to practices in a traditional lab. Future studies should attempt to validate this outcome. Could the economic benefits be further enhanced if there were a larger room to accommodate more terminals than the twenty-four in this situation without sacrificing quality? What will be the relative merits of scheduled vs open lab hour if tutors are available in both situations?
- In the case of Realtime Writer, it is better to examine the number of times faculty should hold on-line dialogue classes in the SYNERGY Center in order to attain better results. In the first study, the faculty held more dialogues.
- When we examine the number of hours students spent with PLATO or CSR and their grades, we find that students spent varying amounts of time with the software

to receive a "satisfactory" or "progress" grade. This should prompt us to question why we hold on to a term or a quarter or a semester as the required amount of time for *all* students to complete a course (Reading Instructors 1 and 2; Writing Instructors 1 and 2; Math Instructors 1, 2, and 3). Can (or should) students be motivated to try harder and finish earlier with the availability of a SYNERGY Center, and can (or should) colleges accommodate variable time for exiting from a course and enrolling in the next?

- Some of the students who received an "unsatisfactory" grade seem to have spent some amount of time in the SYNERGY Center. It might be helpful if faculty examined the SYNERGY Center reports early in the term and evaluated student performance in order to adjust the students' curriculums (Reading Instructor 1, Studies 1 and 2; Writing Instructor 1, Studies 1, 3, and 4; Writing Instructor 2, Studies 1, 2, and 3; Math Instructor 1, Studies 1, 2, 3, and 4).
- The higher withdrawal rate in the experimental groups in several studies across several instructors is of concern to us. Having a tutor in the SYNERGY Center for scheduled or open lab hours would likely reduce the withdrawal rate by providing the human touch. Following are synopses of the studies accompanied by statistical tables.

Reading Instructor 1

First Study REA 0002 Winter 1991

Experimental I met twice a week in a regular classroom and spent lab hours in the SYNERGY Center (CSR), including a once-a-week scheduled hour with a tutor. Control met twice a week in a regular classroom and spent a once-a-week scheduled lab hour in the College Prep Reading Lab with tutors.

Second Study REA 0002 Fall 1991

Experimental I met twice a week in a regular classroom and spent lab hours in the SYNERGY Center (CSR), including a once-a-week scheduled hour with a tutor. Experimental II met twice a week in a regular classroom and had the option to spend lab hours either in the College Prep Reading Lab or in the SYNERGY Center (CSR), including a once-a-week scheduled lab hour in the College Prep Reading Lab or the SYNERGY Center with a tutor. Control met twice a week in a regular classroom and spent a once-a-week scheduled lab hour in the College Prep Reading Lab with a tutor.

Third Study REA 0002 Winter 1992

Experimental I met twice a week in a regular classroom, spent lab hours in the SYNERGY Center (CSR), including a once-a-week scheduled lab hour with a tutor. No control group was available.

Fourth Study REA 0002 Fall 1992

Experimental I met twice a week in a regular classroom and spent lab hours in the SYNERGY Center (CSR), including a once-a-week scheduled hour with a tutor. Control met twice a week in a regular classroom and spent a once-a-week scheduled lab hour in the College Prep Reading Lab with tutors.

Table 1
Grade Distribution of Students in Percents

	Study 1				Study 2				Study 3				Study 4			
Group	N	S/P	U	W	N	S/P	U	W	N	S/P	U	W	N	S/P	U	W
Experimental I	24	75	21	4	28	75	7	18	23	73	13	13	25	64	4	32
Experimental II	NA				25	65	13	21	NA				NA			
Control	26	69	12	19	26	65	13	21	NA				29	66	21	14

Note: S/P = Satisfactory U = Unsatisfactory W = Withdrawal NA = Not Applicable

Table II
Median and Mode of Hours Spent by Students with CSR

	Study 1			Study 2			Study 3			Study 4		
Group	N	Median	Mode	N	Median	Mode	N	Median	Mode	N	Median	Mode
Experimental I S/P	17	10	11	21	11	13	17	14	14	16	10	10
U	4	4	4	1	5	5	2	1	1	1		
Experimental II S/P		NA		15	10	14		NA			NA	
U		NA		4	1	1		NA			NA	

Table III
Number of Students Receiving S/P Grade and Their Hours with CSR

	Study 1	Study 2		Study 3	Study 4
Experimental Group	I	I	II	I	I
N	18	20	14	17	18
Hours					
Up to 10	6	8	6	5	10
11–20	12	11	7	12	6
21–30		1			2
31–40			1		

Reading Instructor 2

First Study REA 0002 Winter 1991

Experimental met twice a week in a regular classroom and spent lab hours in the SYNERGY Center (PLATO), including a once-a-week scheduled hour in the SYNERGY Center with a tutor. Control met twice a week in a regular classroom and spent a once-a-week scheduled lab hour in the College Prep Reading Lab with tutors.

Second Study REA 0001 Fall 1991

Experimental met twice a week in a regular classroom and spent lab hours in the SYNERGY Center (PLATO), including a once-a-week scheduled hour in the SYNERGY Center with a tutor. Control met twice a week in a regular classroom and spent a once-a-week scheduled lab hour in the College Prep Reading Lab with tutors.

Third Study

Did not participate.

Fourth Study REA 0002 Fall 1992

Experimental met twice a week in a regular classroom and spent lab hours in the SYNERGY Center (PLATO), including a once-a-week scheduled hour with a tutor. Control met twice a week in a regular classroom and spent a once-a-week scheduled lab hour in the College Prep Reading Lab with tutors.

Table IV
Grade Distribution of Students in Percents

	Study 1				Study 2				Study 3				Study 4			
Group	N	S/P	U	W	N	S/P	U	W	N	S/P	U	W	N	S/P	U	W
Experimental	23	87		13	24	92		8		NA			18	67	22	11
Control	24	96		13	27	85		15		NA			18	80	8	12

Note: S/P = Satisfactory U = Unsatisfactory W = Withdrawal NA = Not Applicable

Table V

Median and Mode of Hours Spent by Students with PLATO

		Study 1			Study 2			Study 3			Study 4		
Group		N	Median	Mode	N	Median	Mode	N	Median	Mode	N	Median	Mode
Experimental	S/P	20	24	25	22	34	38		NA		11	21	31
	U		NA			NA			NA		4	1	

Table VI

Number of Students Receiving S/P Grade and Their Hours with PLATO

	Study 1	Study 2	Study 3	Study 4
Experimental Group	1	1		1
N	20	22	NA	11
Hours				
Up to 10	6	4	NA	5
11 - 20	3	1	NA	1
21 - 30	7	6	NA	3
31 - 40	4	3	NA	2
>40		8	NA	

Writing Instructor 1

First Study ENC 0020 Winter 1991

Experimental I met twice a week in a regular classroom and spent lab hours in the SYNERGY Center (PLATO) and in the College Prep Writing Lab. Control met twice a week in a regular classroom and spent lab hours in the College Prep Writing Lab.

Second Study ENC 0020 Fall 1991

Experimental I met once a week in the SYNERGY Center (Write & PLATO) and once a week in a regular classroom and spent a lab hour in the SYNERGY Center (PLATO). Experimental II met once a week in the SYNERGY Center (Write) and once a week in a regular classroom and spent a lab hour in the SYNERGY Center (PLATO).

Control met twice a week in a regular classroom and spent lab hours in the College Prep Writing Lab.

Third Study ENC 0020 Winter 1992

Experimental I met once a week in the SYNERGY Center (Write) and once a week in a regular classroom and spent a lab hour in the SYNERGY Center (PLATO). This arrangement was replicated in Experimental II and III. Control met twice a week in a regular classroom and spent lab hours in the College Prep Writing Lab.

Fourth Study ENC 0020 Fall 1992

Experimental I met once a week in the SYNERGY Center (Write) and once a week in a regular classroom and spent once a week in a scheduled lab hour in the SYNERGY Center (PLATO). Experimental II met once a week in the SYNERGY Center (Write) and once in a regular classroom and spent once a week in a scheduled lab hour in the SYNERGY Center (PLATO) with a tutor. Control met twice a week in a regular classroom and spent lab hours in the College Prep Writing Lab.

Table VII

Grade Distribution of Students in Percents

	Study 1				Study 2				Study 3				Study 4			
Group	N	S/P	U	W	N	S/P	U	W	N	S/P	U	W	N	S/P	U	W
Experimental I	25	88	8	4	24	75		25	25	76	4	20	23	74		26
Experimental II		NA			25	68		32	25	44	24	32	23	91		8
Experimental III		NA				NA			23	56	9	35		NA		
Control	23	78	4	17	25	80		20	23	70	17	13	25	96		4

Note: S/P = Satisfactory U = Unsatisfactory W = Withdrawal NA = Not Applicable

Table VIII

Departmental Holistic Score Distribution of Students in Percents

		Study 1						Study 2						Study 3						Study 4					
		N	7-8	6	4	3	2	N	7-8	6	4	3	2	N	7-8	6	4	3	2	N	7-8	6	4	3	2
Experimental I	Pre			NA						NA						NA				10		10	90		
	Post	24	4	42	54			15	6	67	27			17		88	12			10		90		10	
Experimental II	Pre			NA						NA						NA				13		23	69		8
	Post			NA				15	6	41	47		6	10		30	70			13	15	85			
Experimental III	Pre			NA						NA						NA						NA			
	Post			NA						NA				13		77	23					NA			
Control	Pre			NA						NA						NA				16		69	19	13	
	Post			NA						NA						NA				16		94	6		

Table IX

Median and Mode of Hours Spent by Students with PLATO

		Study 1			Study 2			Study 3			Study 4		
		N	Median	Mode	N	Median	Mode	N	Median	Mode	N	Median	Mode
Experimental I	S/P	23	14	14	18	20	22	15	19	17	17	16	18
	U	2	8			NA			NA			NA	
Experimental II	S/P		NA		17	21	19	9	15	16	21	16	21
	U		NA			NA		4	2	2	4	3	2
Experimental III	S/P		NA			NA		11	27	28		NA	
	U		NA			NA		2	5			NA	

Table X

Number of Students Receiving S/P Grade and Their Hours with PLATO

	Study 1	Study 2		Study 3			Study 4	
Experimental Group	I	I	II	I	II	III	I	II
N	22	18	17	17	9	11	17	19
Hours								
Up to 10	5	2	4	3	3	3	5	7
11-20	14	7	4	7	3	1	7	9
21-30	2	8	7	4	1	3	2	3
31-40	1	1	2	3	2	4	3	

Writing Instructor 2

First Study ENC 0020 Winter 1991

Experimental I met twice a week in a regular classroom and spent lab hours in the SYNERGY Center (CSR) and the College Prep Writing Lab. Control met twice a week in a regular classroom and spent lab hours in the College Prep Writing Lab.

Second Study ENC 0020 Fall 1991

Experimental I met once a week in the SYNERGY Center (Write & CSR) and once a week in a regular classroom and spent a lab hour in the SYNERGY Center and in the College Prep Writing Lab. Experimental II met once a week in the SYNERGY Center (CSR & Write) and once a week in a regular classroom and spent a lab hour in the SYNERGY Center and in the College Prep Writing Lab. Control met twice a week in a regular classroom and spent lab hours in the College Prep Writing Lab.

Third Study ENC 0020 Winter 1992

Experimental I met once a week in the SYNERGY Center (CSR & Write) and once a week in a regular classroom and spent a lab hour in the SYNERGY Center and in the College Prep Writing Lab. This arrangement was replicated with Experimental II. Control met twice a week in a regular classroom and spent lab hours in the College Prep Writing Lab.

Fourth Study ENC 0020 Fall 1992

Experimental I met once a week in the SYNERGY Center (CSR & Write) and once a week in a regular classroom and spent a scheduled lab hour in the SYNERGY Center with a tutor. Experimental II met once a week in the SYNERGY Center (CSR & Write) and once a week in a regular classroom and spent a scheduled lab hour in the College Prep Writing Lab with tutors. Experimental II functioned as the Control.

Table XI
Grade Distribution of Students in Percents

	Study 1				Study 2				Study 3				Study 4			
Group	N	S/P	U	W	N	S/P	U	W	N	S/P	U	W	N	S/P	U	W
Experimental I	24	73	13	13	20	65	10	25	20	65	5	30	22	95		5
Experimental II	NA				23	61	9	30	21	62		38	18	49	17	33
Control	18	84	6	11	23	61	10	30	19	84		16	NA			

Note: S/P = Satisfactory U = Unsatisfactory W = Withdrawal NA = Not Applicable

Table XII
Departmental Holistic Score Distribution of Students in Percents

		Study 1						Study 2						Study 3						Study 4					
Group		N	7-8	6	4	3	2	N	7-8	6	4	3	2	N	7-8	6	4	3	2	N	7-8	6	4	3	2
Experimental I	Pre	18			62		38	37			54	38	8			NA				17		6	29	35	29
	Post	18		33	67			13		77	23			13		38	62			17		71	24	6	
Experimental II	Pre			NA				14			50	43	7			NA				9		11	78	11	
	Post			NA				14	29	64	7			13		62	38			9		78	22		
Control	Pre	16			94		6	14			50	21	29			NA						NA			
	Post	16	6	69	25			14	14	29	43		14	17		53	35	12				NA			

Note: The post-essays were scored departmentally. The pre-essays were scored by instructor except in Study 4 which was scored departmentally.

Table XIII
Median and Mode of Hours Spent by Students with CSR

	Study 1			Study 2			Study 3			Study 4		
Group	N	Median	Mode	N	Median	Mode	N	Median	Mode	N	Median	Mode
Experimental I S/P	10	10	9	10	16	15	13	10	8	20	16	18
U	3	4	5	3	9	9	1	10	10			
Experimental II S/P		NA		14	13	10	13	11	6	9	6	7
U		NA		2	6					3	2	2

Table XIV
Departmental Holistic Gain Scores in Study 4

Group	N	Mean Score		
		Pre	Post	Gain
Experimental I	17	3.2	5.4	2.2
Experimental II	7	3.8	5.4	1.6

Table XV
Number of Students Receiving S/P Grade and Their Hours with PLATO

	Study 1	Study 2		Study 3		Study 4	
Experimental Group	I	I	II	I	II	I	II
N	19	13	14	13	13	21	9
Hours							
Up to 10	12	2	6	7	5	5	7
11 - 20	5	10	5	5	8	13	2
21 - 30	2	1	3	1		1	
31 - 40						2	

Writing Instructor 3

First Study ENC 1100 Winter 1991

Experimental met once a week in the SYNERGY Center (Realtime Writer and Write) and once a week in the regular classroom. Control met twice a week in a regular classroom. Both groups were required to write a timed essay that was departmentally and holistically scored at the end of the semester.

Second Study

Did not participate.

Third Study ENC 1100 Winter 1992

Experimental met once a week in the SYNERGY Center (Realtime Writer and Write) and once a week in a regular classroom. Control was not used for this study since an additional section taught by the instructor was not available.

Fourth Study ENC 1100 Fall 1992

Experimental met once a week in the SYNERGY Center (Realtime Writer and Write) and once a week in a regular classroom. Control met twice a week in a regular classroom. Both groups wrote pre- and post-essays which were departmentally and holistically scored.

Table XVI
Grade Distribution of Students in Percents

	Study 1				Study 2				Study 3				Study 4			
Group	N	P	F	W	N	P	F	W	N	P	F	W	N	P	F	W
Experimental	20	70	5	25		NA			22	59	9	32	22	91		9
Control	19	89	5	5		NA							19	89		11

Note: P represents grades A - D

Table XVII
Departmental Holistic Score Distribution of Students in Percents

	Study 1							Study 2	Study 3					Study 4					
Score	N	8	7	6	5	4	2		N	10-12	8-9	6-7	1-5	N	10-12	8-9	6-7	1-5
Experimental	15	0	13	13	13	47	13	Did Not	13	8		92		24	4	12	63	21
All Others	669	1	2	10	17	52	18	Participate	744	4	23	59	13	821	4	20	58	17

Table XVIII
Departmental Holistic Gain Scores in Study 4

Group	N	Mean Score		
		Pre	Post	Gain
Experimental	20	5.3	7.9	2.6
Control	19	5.8	6.5	0.7

Writing Instructor 4

First Study ENC 1100 Winter 1991

Did not participate.

Second Study ENC 1100 Fall 1991

Experimental met once a week in the SYNERGY Center (Realtime Writer and Write) and once a week in a regular classroom. Control met twice a week in a regular classroom.

Third Study ENC 1100 Winter 1992

Experimental met once a week in the SYNERGY Center (Realtime Writer and Write) and once a week in a regular classroom. Control met twice a week in a regular classroom.

Fourth Study ENC 1100 Fall 1992

Experimental met once a week in the SYNERGY Center (Realtime Writer and Write) and once a week in a regular classroom. Control met twice a week in a regular classroom

Table XIX
Grade Distribution of Students in Percents

	Study 1				Study 2				Study 3				Study 4			
Group	N	P	F	W	N	P	F	W	N	P	F	W	N	P	F	W
Experimental	NA				19	68	5	26	20	70	5	25	22	82		18
Control	NA				20	65	5	30	21	71	5	24	22	59	18	23

Note: P represents grades A - D NA = Not applicable

Table XX
Departmental Holistic Score Distribution of Students in Percents

	Study 1	Study 2				Study 3					Study 4				
Group		N	10-12	8-9	6-7	1-5	N	10-12	8-9	6-7	1-5	N	10-12	8-9	6-7	1-5
Experimental	NA	14		21	72	7	17	6	12	69	11	22		14	69	18
All Others	NA	867	5	22	58	16	725	4	23	59	13	821	5	20	58	17

Table XXI
Departmental Holistic Gain Scores in Study 4

Group	N	Mean Score		
		Pre	Post	Gain
Experimental	15	5.5	6.5	1.0
Control	22	5.6	6.0	0.4

Writing Instructor 5

First Study ENC 1100 Winter 1991

Experimental met once a week in the SYNERGY Center (Realtime Writer and Write) and once a week in a regular classroom. Control was not used for this study since an additional section taught by the instructor was not available.

Table XXII
Grade Distribution of Students in Percents

	Study 1			
Group	N	P	F	W
Experimental	19	84	5	11

P = Grades A - D

Table XXIII
Departmental Holistic Score Distribution of Students in Percents

	Study 1						
Group	N	8	7	6	5	4	2
Experimental	18	6	6	17	22	33	17
All Others	660	1	2	10	17	52	18

Math Instructor 1

First Study MAT 0003 Winter 1991

Low score on the Departmental Placement Test was used to select from five sections students who were severely handicapped in math. Students who scored 28% and below formed the Experimental, which met twice a week in a regular classroom; students were given the option of going either to the SYNERGY Center (PLATO) or to the Math Lab. The students who scored higher than 28% formed the Control group. Control met twice a week in a regular classroom and spent lab hours in the Math Lab.

Second Study MAT 0003 Fall 1991

Experimental met twice a week in a regular classroom and spent lab hours in the SYNERGY Center (PLATO). Control met twice a week in a regular classroom and spent lab hours in the Math Lab.

Third Study MAT 0003 Winter 1992

Experimental I met twice a week in a regular classroom and spent lab hours in the SYNERGY Center (PLATO). Experimental II met twice a week in a regular classroom and spent lab hours either in the SYNERGY Center or in the Math Lab. Control met twice a week in a regular classroom and spent lab hours in the Math Lab.

Fourth Study MAT 0003 Fall 1992

Experimental met twice a week in a regular classroom and spent lab hours in the SYNERGY Center (PLATO and textbook software). Control met twice a week in a regular classroom and spent lab hours in the Math Lab.

Table XXIV
Grade Distribution of Students in Percents

	Study 1				Study 2				Study 3				Study 4			
Group	N	S/P	U	W	N	S/P	U	W	N	S/P	U	W	N	S/P	U	W
Experimental I	31	74	16	10	38	55	21	24	33	45	24	30	36	45	47	8
Experimental II	NA				NA				30	43	40	17	NA			
Control	26	50	19	31	38	58	29	13	34	44	36	21	34	35	32	32

Note: S/P = Satisfactory U = Unsatisfactory W = Withdrawal NA = Not Applicable

Table XXV
Distribution of Students in Percents for Gain Scores on Departmental Exams

	Study 1			Study 2			Study 3			Study 4		
Group	N	≤30	>30	N	≤30	>30	N	≤30	>30	N	≤30	>30
Experimental I	23	26	74	38	45	55	17	24	71	19	47	53
Experimental II	NA			NA			15	67	33	NA		
Control	18	44	56	38	35	65	16	44	56	12	17	83

Table XXVI
Median and Mode of Hours Spent by Students with PLATO

	Study 1			Study 2			Study 3			Study 4		
Group	N	Median	Mode	N	Median	Mode	N	Median	Mode	N	Median	Mode
Experimental I S/U	22	18 13		21	20	26	14	22	18	16	14	20
U	9	2222		8	9	7	8	2	4	10	2	2
Experimental II S/U	NA			NA			20	28	26	NA		
U	NA			NA			1	2	2	NA		

Table XXVII
Number of Students Receiving S/P Grade and Their Hours with PLATO

	Study 1	Study 2	Study 3		Study 4
Experimental Group	I	I	I	II	I
N	22	21	14	20	16
Hours					
Up to 10	10	6	3	10	4
11 - 20	6	5	5	2	7
21 - 30	3	4	4	2	5
31 - 40		3	1	2	
>40	2	3	1	4	

Math Instructor 2

First Study MAT 0024 Winter 1991

Experimental met twice a week in a regular classroom and spent lab hours in the SYNERGY Center (CSR). Control met twice a week in a regular classroom and spent lab hours in the Math lab.

Table XXVIII

Grade Distribution of Students in Percents

	Study 1			
Group	N	S/P	U	W
Experimental	34	41	18	41
Control	36	58	28	14

Note: S/P = Satisfactory & Progress U = Unsatisfactory W = Withdrawal

Table XXIX

Median and Mode of Hours Spent by Students With CSR

	Study 1		
Group	N	Median	Mode
Experimental S/P	14	9	18
U	6	2	3

Table XXX

Number of Students Receiving S/P Grade and Their Hours with CSR

	Study 1
Experimental Group	1
N	14
Hours	
Up to 10	2
11 - 20	7
21 - 30	4
31 - 40	1

Math Instructor 3

First Study MAT 0024 Winter 1991

Students for the Experimental group were selected at random from names appearing on the preliminary class rosters of two sections. Students not selected for membership in the Experimental were assigned to the control. Students in both groups were required to spend a minimum of thirty-two hours in the Math lab, where they had access to tutoring by students and faculty as well as to videotapes and software pertinent to the course material. Those in the Experimental group were given the option of using CSR in the SYNERGY Center for the required lab hour.

Table XXXI

Grade Distribution of Students in Percents

	Study 1			
Group/Grade	N	S/P	U	W
Experimental	25	44	12	44
Control	36	44	17	39

Note S/P = Satisfactory & Progress U = Unsatisfactory W = Withdrawal

Table XXXII

Median and Mode of CSR Modules Completed by Students

	Study 1		
Group	N	Median	Mode
Experimental S/P	11	21	29
U	3		

Table XXXIII

Number of Students Receiving S/P Grade and Their Hours with CSR

	Study 1
Experimental Group N Hours	1 11
Up to 10	9
11 - 20	
21 - 30	1
31 - 40	1

Bakersfield College SYNERGY Center

Greg Chamberlain, Software Implementation Designer, is an Associate Professor of Computer Studies and Director of Academic Computing at Bakersfield College. Professor Chamberlain has an M.A. in Computer Education from Fresno Pacific College and has extensive experience in setting up computer systems, including networks for the use of underprepared students. He works with other faculty members in integrating software with curriculum and conducting research. He is currently working on his Ed.D. in Educational Technologies at the University of Northern Colorado.

Information about the College

Bakersfield College is located 100 miles north of Los Angeles in south-central California. The Kern Community College District, a three-college district of which Bakersfield College is a member, is the largest community college district in California. Bakersfield College serves the major population areas and about 60% of the District territory.

Bakersfield College was established in 1913. The first full year of operation on the present campus was in 1956. By 1977, the college enrolled nearly 14,000 students in a comprehensive program of instructional offerings. Proposition 13 had a severe economic impact on the college, reducing its enrollment to less than 10,000 in 1985-86 and changing its financial status from a high-wealth district prior to the mid-70's to a low-wealth district eligible for state "equalization" funds by the early 90's. By 1992 enrollment had gradually increased to approximately 12,500, with many potential students being turned away because of the lack of instructional offerings.

Since 1980, the area population has been growing at 3 to 5% per year, one of the fastest growing areas in the state; thus, the college has steadily fallen behind in the percentage of adults served. In addition, a significant increase in minority student populations (Hispanics increased from 14% in the late 70's to 24% in 1992, with total minority enrollment reaching 38%) has placed extraordinary demands upon the support services, traditional curriculums, traditional teaching strategies and techniques, and fiscal resources of the college. Bakersfield College must meet the needs of this new, diverse, nontraditional student population which now comprises a significant portion of the total student body and attempt to serve increased numbers of students with existing resources.

The percentage of part-time students (taking fewer than 12 credit units) has been 70-75% percent for at least 15 years. The number of full-time day students, the yardstick used in many studies to define the "traditional" student, was between 2,800 and 3,000 from 1985 to 1990. The number of full-time students taking day and/or evening classes is now increasing and is up to 3,337. Evening-only enrollment has remained at about 35% for the past several years.

In 1992, for the sixteenth straight year, Bakersfield College had more female students (55.9%) than male (44%). Bakersfield College serves a student population with an ethnicity that is not mirrored in the faculty and staff but is fairly close to the overall statistics of the county. The percentages are shown in *Table I*.

Bakersfield College is an open-door institution dedicated to meeting the educational needs of this community with high standards and flexibility toward program development. In keeping with the California Master Plan for Higher Education, Bakersfield College serves statewide purposes while meeting local needs. These local needs create an important role for the college and its community. First, the city and its environs are geographically isolated, making commuting to comparable institutions impractical. Second, Bakersfield College is one of only two institutions in the area offering post-secondary education. Finally, the community that Bakersfield College serves is one of the most rapidly expanding in California and the nation (eighth fastest in the U.S.); local businesses are becoming more diverse and technologically advanced, requiring highly trained personnel.

Table I

Ethnicity at Bakersfield College

Ethnicity	Students	Faculty	Staff	County
White	62.3	80.6	58.5	66.6
Hispanic	23.7	8.9	26.8	24.4
Black	6.1	6.7	9.7	5.1
Asian	2.6	2.5	.3	
Filipino	1.8			
American Indian	2.1	.4	1.5	
Other/ Unknown	1.4	.8	3.0	3.9

The mission of Bakersfield College lists among its goals to provide the following:

- a significant remedial and developmental program to serve the needs of a diverse student population and enhance their ability to make useful contributions to society.
- a wide range of student services to assess, guide, and support students.

Fundamental to these statements is the belief that education should be self-directed, lifetime learning that benefits both the individual and society.

There are other local issues that affect Bakersfield College. Educational attainment rates are some of the lowest in the U.S. For example, the region ranks last in the state in the number of high-school graduates eligible for admission to the state university systems and has the state's lowest participation rate for comprehensive colleges and universities. When coupled with the high dropout rate (30 to 40% in the area), it is very clear to us that the region's economic and educational development is very much "at risk." Such low educational attainment is further manifested in community conditions of poor health care, high unemployment, and limited access to ESL and migrant-education programs. Bakersfield College serves many re-entry students who have never received appropriate preparation for college-level courses. In the Kern County area alone, there are 35,000 persons in need of adult-literacy instruction in order to reach a "functional" level of literacy. Clearly, programs are needed to assist these populations.

Those students who do attend Bakersfield College and transfer to a four-year institution in the California State University System consistently outperform other transfer students, as well as students native to those schools.

Developmental Education at Bakersfield College

Offering developmental-education courses to raise skill levels of incoming students to college level is mandated by Title V (sections 55001 and 55520) of the California Education Code. Skills-development work must be offered by course faculty in addition to the content material, by a developmental-program faculty, or by both.

There is a gap in the state of California between what high-school graduation certifies and the skills required to function successfully in college-level courses. The basic-skills needs of incoming students continue to increase. Though the percentages of total students requesting help in basic skills decreased from Fall 1991 to Fall 1992, the *number* of students *increased* in all categories. We feel there continues to be a large population of students in need of remediation that remains unassessed (See *Table II*).

Table II

Assessment Scores at Remedial Levels

	Fall 1992		Fall 1991	
Skills	No.	%	No.	%
Writing	1,376	33.13	1,081	35.75
Reading	986	23.74	763	25.23
Numerical	2,217	53.38	2,569	84.95
Study	1,950	46.95	1,608	53.17
Totals	**4,153**		**3,024**	

Developmental education at Bakersfield College is handled mainly by four departments. The **Academic Development Department** offers more than twenty different developmental-education courses in math, reading, spelling, study, vocabulary, and writing skills. The **English Department** offers three courses at two different levels below the freshman-composition level. The **ESL Department** offers eight courses including grammar, listening, reading, speaking, syntax, vocabulary, and writing skills courses below its transfer-level curriculum. The **Mathematics Department** offers six traditional high-school level classes below its calculus sequence.

The college counselors and advisors use multiple criteria (e.g., ASSET placement scores, placement essay, high school and/or college transcripts, educational plans) to recommend initial placements. In addition, students, through self-determination and/or faculty recommendation, may place themselves in developmental-education courses.

Developmental-education courses are all non-degree-applicable credit courses. Since they bear college credit, courses demand that students perform at high levels. Most courses are competency-based, and courses are generally graded on an A-B-C-D-F scale, though in some courses students might have the option of Credit-No Credit grading. In terms of passing classes, success differs from course to course and section to section. The informal feedback from participants is that the availability of the SYNERGY Center increases retention rates for the first part of the term, enabling more students to get far enough into the course to see the light at the end of the tunnel and complete the term. This project, as well as others undertaken recently, have shown us the need for additional campuswide student tracking and for an institutional research office.

Faculty Case Studies

Since this was our first term participating in the study, we approached the project by asking for volunteers. We held a meeting where the system was demonstrated, the Project SYNERGY video shown, and the potential discussed. There was great enthusiasm; many instructors indicated a desire to participate. In reality, very few followed through with complete case studies. Many others spent time evaluating the software for future terms, trying to see how the SYNERGY Center might be used for their classes. No formal reports were required of these instructors. Following are case studies for Joyce Kirst, Associate Professor/High Technology Specialist and Learning Disabilities Coordinator, and Jerry Ludeke, Professor of Reading/Learning Specialist, along with the responses of other instructors who received accounts for their classes and had very distinct, and often different, perceptions of the lab's effectiveness. Joyce and Jerry each speak on their own behalf.

Use of DESKlab for Disabled Students

Joyce Kirst has been the coordinator of the Learning Disabilities Program and the High-Tech Center for Students with Disabilities since 1990. Prior to that she served disabled students at the university, college, and K-12 levels. Her B.A. in Psychology and Special Education was earned at St. Luis University in 1981. She earned an M.A.E.D. in Counseling and Guidance for Higher Education in 1988 from Cal. Poly. San Luis Obispo.

The Setting

About the Course

If students demonstrate precollegiate-level writing proficiency at Bakersfield College and are identified with verified disabilities, they are eligible to receive specialized instruction through the Strategic Learning System's Writing Course designed to prepare them for college-level English courses. For the current study, students in the Strategic Learning System's Writing Course were required to master simple, compound, complex, and compound-complex sentence styles, and they were expected to be able to develop 150-word paragraphs in present and past tenses. The course utilized a combination of lectures, worksheets and writing assignments, verbal and written feedback on all work, and mastery-learning techniques.

Those who concurrently enrolled in *Word Processing for Disabled Students* also completed fifty-four hours of computer access through procedural demonstrations, practice writing assignments, and group projects. Approximately 75% of the time was spent writing and revising essays. All word-processing commands were presented on step-by-step forms developed by the instructor, demonstrated by either the instructor or a student, and practiced through weekly writing assignments. Grades were based on completing fifty-four hours of computer access. Students were expected to use the lab at least one hour per week to work independently on assignments, in addition to the two hours of lecture/lab time spent in class. The course did not contribute toward completion of degree requirements, using a Credit/No Credit grading system rather than letter grades in order to provide a non-competitive learning experience. However, letter grades were issued in the companion writing course as usual. In addition, students were required to pass the standard writing proficiency Exit Exam developed by the English Department before proceeding to their next English course.

About the Students

All eleven students enrolled in *Word Processing for Disabled Students* had verified disabilities which impacted writing performance in some way. Most had learning disabilities; one had low vision, and one was identified with psychological disabilities. They had been referred to the special writing program after multiple measures were used to determine an appropriate course placement: sample essay, high-school course sequence and grades, reading level, counselor's evaluation, and student's self-report.

Demographically diverse, the students represented a cross-section of the general student population: 7 men, 4 women; 2 identified themselves as Black, 2 as Hispanic, and 7 as White; ages 19 to 50; three were single parents; and 100% had verified disabilities. None had taken previous computer-related courses.

About the Software

This study utilized Microsoft Write and Express Publisher in the SYNERGY Center and WordPerfect in the High Tech Center on campus. Please see a description of CSR provided in Appendix D.

The Design

Two sections of this special writing course were presented in Spring 1993. Each student received information regarding a new companion course, *Word Processing for Disabled Students*, and was invited to enroll in both classes during the Spring 1993 semester. They were told that they would have the option to use a computer for their Exit Exam in May if they took the new course. Of the twenty-five students enrolled in two sections of the special remedial writing class, eleven chose to enroll concurrently in the computer writing class.

The study focused primarily on how the skills of those enrolled in both courses developed in regard to writing and word processing. These students received computer command forms, demonstrations, or additional writing assignments from the computer class. Their writing progress was tracked in the usual way by the writing instructor, as was that of the students in the regular course only.

Monitoring the Study

Some students were more reluctant at first to compose essays using the computer (they preferred to handwrite a draft first), but later they started each essay directly on the computer.

When surveyed, the students unanimously preferred the SYNERGY Center to the older High Tech Center because the software included mouse support that they felt made it easier to learn and remember, the lab was very quiet, the computers were new, and the furniture was more comfortable.

Although a few students focused on meeting the minimum number of required computer hours, most exceeded the minimum, and even used the computers to complete written assignments for other courses. Perhaps more noteworthy is that, by the end of the semester, the instructors in the writing and computer courses observed that all six students were able independently to open, write, edit, print, and save a document, while simultaneously attending to proper writing techniques in the final product (thesis development, sentence structure, tense, punctuation, spelling, etc.). The students expressed a sense of new-found confidence in their writing and in using the computers. All of the students intended to continue their English course sequence in the next semester. Perhaps a larger experimental group would show more variation in students' skill development, but the results remain very positive for this group.

Student Outcomes

The results were very encouraging. All six students who completed both courses passed the writing course and the English Exit Exam (using a computer). Of the eleven students who started the course, three withdrew and one received No Credit (due to excessive absences). All cited personal problems (they also withdrew from the companion writing course). One additional student was unable to attend class regularly because he worked unpredictable shifts in the oil industry, but he chose to remain in the course even though he knew he would probably not receive Credit (his grade was No Credit for the semester). The six remaining students earned Credit for *Word Processing for Disabled Students*. Notably, all six also passed the companion writing course and the English Exit Exam.

Recommendations

A precourse writing sample should have been kept to compare against the Exit Exam, thus demonstrating exactly how the students' skills improved.

Since WordPerfect is the campus standard, I expected the students to learn at least the basic

commands in that program. However, they had to access it in the High Tech Center because it was not available in the SYNERGY Center. I recommend that the campus purchase the rights to use its standard word processor in all labs, including this new lab.

The students frequently requested that mouse pads be purchased for the lab.

The preparation time for this new course exceeded my original expectations. I estimate that I spent three to five hours of prep for every hour in class. This prep included learning the new software, training lab aides, writing new course curriculum, setting up and monitoring student records, and evaluating the program's success.

Use of CSR, GUIDES, and Summary Writing for a Reading Class

Jerry Ludeke has worked with underprepared students at Bakersfield College for twenty years. She has taught study skills, reading, and English and has directed the Learning Disabilities Program. After attending Sweet Briar College, she received her B.A. from Indiana University (1954) in English and art, an M.F.A. from Tulane University, and an M.A. in Counseling and Guidance from Stanford University. She has also completed post-graduate courses in reading.

The Setting

About the Course

Reading 50 is the third level of the pre-collegiate reading classes. It is the level which must be passed to certify reading competency for graduation for those students who entered college without that certification complete, based primarily on ASSET placement scores. Students are placed in the course on the basis of multiple measures, the most prominent of which are their ASSET reading score, their high-school GPA, and their high-school record. The emphasis in the course is on critical thinking/reading in preparation for collegiate-level classes. Further, the students are expected to develop the ability to clearly express in writing their answers to higher-level questions asked on the material read.

About the Students

The initial enrollment in Section 1 was 32, reducing to 25 for the 4-week enrollment, of whom 20 completed the course. Of the 25 students, 48% were White (non-Hispanic), 32% Hispanic, 16% Black, and 4% other ESL (English as a Second Language); 16 were males and 9 were females. Three (12%) were already certified as having learning disabilities and 36% were ESL students. None had physical disabilities that impacted on their classwork. As a result of recent California guidelines which eliminated our mandatory placement and made it possible for students to sign into a class regardless of prior performance or testing results, 25% of the original 32 had not passed the preceding class. By the time of the 4-week enrollment figure, only 16% of the 25 remained who had not passed the preceding class. Fifteen of the 23 tested (65%) scored below 55 on the independent level of the DRP (Degrees of

Reading Power test), which is below the recommended score for entering the Reading 50 class. The lowest score was a 35.

Section II initially had 34 students, dropping to 28 on the 4-week enrollment, of whom 21 completed the course. Of the 28 students, 29% were White, 43% Hispanic, 21% Black, and 7% other ESL; 12 were male and 16 were female. Seven persons (25%) were previously certified as having a learning disability, 18% had not passed the preceding class, and 14 of the 24 tested (58%) were below 55 on the DRP, with the lowest score being 42.

The Design

Although the students were divided randomly into two classes at the point of registration, they did not seem to be especially well-matched for an experimental and control group. It was decided that we not design this as a true experiment. Instead, both classes would be lumped as one for observations and comments. The combined total of 53 students gave us 38% White, 38% Hispanic, 19% Black, and 5% other ESL; of these 53% were male and 47% female.

The emphasis of the study would be on looking at (1) the differences between several materials used in the SYNERGY Center, and (2) the advantages and disadvantages of using the lab for part of the classwork.

Three materials were used in this study: (1) the *CSR Reading Level IV*, which was the only material provided in our SYNERGY Center appropriate for reading; (2) *GUIDES Reading and Study Skills*, which we had on approval with permission to try students on it; and (3) *Summary Writing*, designed at the Indiana University Learning Skills Center.

As instructor, I chose the point at which materials in the lab were to be introduced. Each class went with me as a group into the lab to work for the class hour. This permitted me to introduce the materials, set the stage, troubleshoot difficulties, monitor the progress, and summarize at the end what had been covered during the hour. Students who had not finished a particular assignment during the classtime were directed to complete it on their own before the next class and to turn in the printout which indicated completion. Since this was the first use of the materials, all students were requested to turn in comments on the usefulness and user-friendliness of the materials.

At final count we spent eight class hours working in the lab, with many students putting in additional lab time outside the class.

Monitoring the Study

Use of Computers

Students enjoy using computers! Computers offer constant interaction and readily adjust to the speedster or to the lolly-gagging student. No one in the group seemed intimidated by the computer, though several had no prior experience. Since we did not go into the SYNERGY Center until the sixth week of school, the class had already established a camaraderie so students gave to and received technical help from neighboring students quite readily. It helped that the instructor had worked through all the materials in the student mode and could thus anticipate confusing instructions or difficult spots in the programs. It is also true that the basic SYNERGY Center program is easy to access.

Because there were only twenty computers in the SYNERGY Center, we ran into the necessity to double up on computers; this is basically unsatisfactory when students should be thinking for themselves.

The fact that students enjoyed the computers was seen when, having told them what day to meet in the lab, I arrived early to find many of the students already there, signed in, and pecking away.

Use of Summary Writing

Our first exercise in the SYNERGY Center involved the *Summary Writing* course from Indiana University (Student Academic Center,

316 North Jordan Avenue, Bloomington, IN 47405, 812-855-7313). This is a well-conceived program in which students are interacting with the computer and writing on a six-page worksheet for which the master is provided. Students were very clearly led through the steps of writing a summary, practicing it step by step, and then following through on paper. Each step is checked against answers on the computer. When finished, students have an accurate description and model in hand to which they can refer in the future. This was finished within two days in the lab.

The students and I both were excited about this program. Students felt that the step-by-step explanation gave them a strategy for writing summaries and a new understanding of what summary writing entailed. As the instructor, I was excited because I felt that the program was so designed that it did a better job of leading each individual student through the process of summary writing than I could do in the same amount of time in class. Further, it was an excellent introduction for me to follow through on with more extensive materials. I was so enthusiastic that two other Reading 50 teachers used the program with their classes with equally enthusiastic receptions.

Use of CSR Reading Level IV

After several classroom sessions of follow-up on *Summary Writing*, we returned to the SYNERGY Center to use the CSR materials.

Out of the sixteen modules available in Level IV, I judged the first seven as being too simplistic for this class, so the students began with *R1119: Determining the Implied Main Idea in a Paragraph*. Most of the students went barreling through getting 80% and 100% without ever getting to the tutorials. While students were reminded by the pretest to focus and were given ("taught") some helpful tips, they were primarily required simply to recognize the correct answer, a far easier task than picking it out and verbalizing it for themselves. In fact, it was fairly easy to read the questions with the multiple-choice answers and successfully guess at what was the most logical answer without even reading the selection on which the questions were based.

Use of GUIDES Reading & Study Skills

After several days in the lab working with CSR materials and several days back in the classroom, we returned to the SYNERGY Center to work on the *GUIDES Reading and Study Skills* materials.

These materials are more sophisticated in that each pretest is diagnostic and, on the basis of the first two articles, a student may be branched to more difficult material. The student is able to get an immediate printout of the diagnostic-test results showing the different types of questions, the number of questions of each type, and the number correctly answered on the first try and on the second try. The printout also gives main-idea responses generated by the students and compares them to suggested main-idea statements. (Students have gotten so used to simply reacting to multiple-choice questions that, the first time they have to generate the main idea from what they have just read, they often realize they have been working mechanically and begin to laugh because they were "caught.") A more detailed instructor's report is generated at the same time. The report recommends appropriate follow-up materials based on the diagnosis. Completing a diagnostic pretest takes most students a class hour.

Students' reactions to the *GUIDES Reading and Study Skills* were primarily positive. They focused on the fact that the follow-ups really helped one gain practice in the particular areas showing weakness.

Student Outcomes

Course-completion rate for both sections remained fairly the same. Of the 25 students enrolled in Section I, 21 completed the course; 21 of the 28 students enrolled in Section II completed the course as well. However, the rate of students getting a C or above (meeting competency) in both sections of my Reading 50

classes is lower this semester than usual. Of the two known variables impacting on that (eight hours spent in the lab rather than in class, and a higher percentage of unprepared "ineligible" students), I feel that the inappropriate placement of students was probably the strong factor.

I had questions that I sought to answer during the trial usage of the SYNERGY Center. Will the use of computers with a precollegiate reading class improve students' reading ability more than, less than, or equal to the amount of improvement gained in a traditional class setting? Is there a role for computer instruction in remediating deficiencies typically found in these students' reading abilities? Is computer instruction most effective within the classtime or as supplemental to it? What benefits can and cannot be expected from computer instruction? Will the type of remediation gained through computer instruction show up in improved standardized test scores or in improved evidence of critical thinking in response to reading?

In this short period of time, I have no definitive answers, but I do have preliminary impressions.

- Computer instruction *can* be a very effective means of instruction. The *Summary Writing* course was an example of that. I felt that the two hours spent in the lab on this program were more productive for the students than spending the same two hours with me in the classroom setting working on summary writing. They set the stage for my classroom follow up. As long as a computer lab is available to me, I will use the *Summary Writing* program with my classes during classtime and will encourage all other Reading 50 teachers to do the same.

- Computer instruction is most effective when it is followed up in the classroom. If I were to have my students do the *Summary Writing* program and then did not follow through with classroom application of the strategy learned, the program would be of limited value.

- Computer instruction can give a false impression of thinking, both to the student and to the instructor. Students working on the CSR pretests felt that they were thinking and learning because they were active. As the teacher, I felt they were thinking at a surface level and making use of good multiple-choice guessing skills without being asked to do much true critical thinking.

- Management programs are a necessity if computer instruction is to be used in an educationally sound way. The *GUIDES* materials are impressive and thought-provoking. However, the lack of a management system makes it extremely cumbersome for a classroom teacher working without backup help to be sure that students are moving along in materials that are challenging, helpful, and appropriate to each individual.

- Instructors must be thoroughly familiar with materials assigned in the computer lab. Without that familiarity, computer instruction may be helpful on its own, but it will not be well integrated into the class goals for maximum benefit.

- The quality of results gained from computer instruction is primarily a function of the quality of materials used. Choose well and carefully! While an excellent teacher integrates the computer instruction into the total class, if the computer materials are ineffective, then the result is fewer hours of benefit from that teacher's expertise.

- Computers offer a way to adjust to the needs of students with a wide variety of skills within one class. Additional work on the computer for the weakest students in a class can offer the extra boost needed to bring their performance up to par.

- In summary, while I see the potential value of the SYNERGY Center's being integrated into the classroom, I feel its value is currently limited by the non-availability of good materials to develop critical thinking. Because I believe in the importance of modeling the thinking process and of guiding students' practice in ever more complex, college-level materials, I feel that time in the classroom will always be an important factor in improving reading at this level unless some outstanding programs are developed which build student output into the program. I have not seen such programs yet and, until I do, I will probably be stuck between the *Accommodation* and *Assimilation* stages of Kamala Anandam's Software Implementation Model.

Recommendations

To Faculty and Administrators

- Instructional goals must be clear to both faculty and student. The faculty must know how a specific computer program fits into the course requirements, and students need to know how each computer assignment leads to the achievement of specific course goals.

- Second, time needs to be allotted for searching the reviewed materials (Project SYNERGY is a tremendous help here). Then monies need to be spent on worthwhile materials. The possession of a bank of computers is the baseline, but the usefulness of those computers educationally depends on the quality of the materials purchased.

- Further, technical support needs to be provided by the administration so that faculty can concentrate on the students, the software, and the course goals and curriculum.

- Finally, we need a good management program which makes it possible for the faculty to monitor progress and to give timely, appropriate feedback to students.

Other Observations

Christy Ballard, Instructor of Mathematics

Christy took her Math 50 (Basic Math) class into the lab and used the CPT and a few CSR modules. She found her students to be "enthusiastic about using the computers" and noted that several of her students went to the lab on their own time to work through additional modules. Her students requested more tutorials on American units of measure, metric units of measure, and algebra. Since we have only the modules that came with the SYNERGY Center, we are looking into the possibility of expanding the selection for next year. Christy adds: "From the positive experience we have had this semester in the SYNERGY Center, I will continue to take my Math 50 classes to the Lab." She has also said that she wants to bring in her algebra classes as soon as we have appropriate software available.

Debra Cantrell, Associate Professor, Learning Disabilities Specialist

Debra looked through the available math software and did not feel it would work for her teaching style. She wants to do all instruction in the classroom and turn over to the lab most of the drill and practice she usually does in class. Next fall, she hopes to do a study with one of her math classes using the lab for drill and practice, while the control group has no required lab hours. She anticipates the added classtime gained by removing most of the drill and practice from the classroom will allow her

to provide more remediation. We will be evaluating drill-and-practice software for this purpose.

Mildred Colvin, Adjunct Faculty, Reading

Mildred took her class to the lab to use *Summary Writing* and had a very frustrating experience. She is not very comfortable with computer technology and felt unprepared. She suggested that we provide comprehensive faculty computer training so that faculty members can truly "immerse" themselves in the technology and feel comfortable when using it in class. She related that her students, however, felt comfortable and believed that they had learned from the sessions. Many students did express a desire to return. She felt the lab was potentially a great tool, as long as the faculty were properly prepared to use it.

Judy Garrett, Professor of Foreign Languages/ESL

Judy has been reviewing ESL software for several years now and, while she did not use the lab this year, she is hoping to use it next year. She would like to see the addition of some voice-synthesis capabilities to utilize some of the better ESL software she has found. As always, budget constraints are an issue, but we will do what we can.

Dorothy Stanley, Professor of Mathematics

While Dorothy has not directly participated in the lab, she took the time to go through the CSR modules and cross-reference them to the learning objectives of our math curriculum, making these available to all of the math faculty. This process has been a great help to other faculty wishing to use these modules. She feels, as do many others, that the modules provided with the initial lab are not sufficient in scope to teach an entire course in the lab.

Donna Starr, Assistant Professor of Mathematics

Donna previewed some of the existing software and did not find something she felt would work for her Intermediate Algebra classes. She is hoping to add *Derive* to the system next fall and use the lab on an *ad hoc* basis.

Paul Meert, Professor of Mathematics

Paul signed up to use the lab only to find that the software provided with the textbook that he planned to use was incompatible with the ICLAS system. He has since adopted a different book for next fall that comes with a different software package, and we are anticipating being able to accommodate his needs in the next term.

Howard Quilling, Professor of Learning Skills

After hearing great things from Jerry Ludeke regarding *Summary Writing*, Howard brought all four sections of his Reading 50 course to the lab to use *Summary Writing* and the word-processing capabilities of Microsoft Works. Howard felt that "the experience was well worth the effort and also gave the class a new dimension." Several students said that, on some occasions, they had gone to the lab outside of the required class periods. Howard plans to take his classes into the lab next fall and is already reviewing software for use in the spring of '94 when he plans to teach an Advanced Reading class in the lab.

What Have We Learned?

There were many challenges to putting together and implementing the SYNERGY Center. Following are what I perceive to be a few of our problems. We did not push the participants hard enough to design full-scale research models. Perhaps we should have selected the

specific instructors rather than ask the general faculty for volunteers. Ideally, some released time or a stipend would be made available for instructors participating in full studies. We did not set aside enough funding for supplemental software purchases, thereby frustrating several of the participants. The most common complaint from users was a lack of comprehensive software.

There was not enough *formal* training of faculty in the use of the lab. Although there were staff and orientation available to assist, more formal instruction would make the faculty better aware of the available resources, and the different ways to implement them.

We initially worked to involve the Learning Center staff and did not push to involve the Math and English Departments. We did this thinking that the response was so strong at first among just the Learning Center faculty that we would have too many participants for the first term. We will be working more directly with these other departments in the future.

As a beta site for DESKlab, we received updates which were installed during the term, causing on one occasion the loss of some student data.

We were often faced with an unwillingness in instructors to change methodology, books, and so on to accommodate the shifting instructional paradigm. In future studies, the need to consider these changes will be encouraged more, and additional assistance in doing so will be provided.

It was difficult to get institutional research data. There is a definite need to track *schoolwide* student success and dropout rates.

Our story was not just one of problems, however. There were several things we did that we felt contributed greatly to the program, and there were some unexpected benefits as well.

We hired an ambitious, knowledgeable full-time lab manager, with good communication skills and outstanding technical abilities. We were encouraged by Miami-Dade's experiences to think that this person was a very important component, and we are in complete agreement!

We let success breed success. Many of the faculty planning to use the lab next year are doing so because of word-of-mouth encouragement from other participants.

We found an excellent facility, with an environment that is very conducive to learning. All institutions must deal with "turf" issues, but those were solved, thus enabling the facility to be housed in a large, comfortable room.

We sent technical personnel to St. Philip's College for training with the famous "Bill & Bill" [Bill Biggs & Bill Davis], thus enabling us to operate with very few technical problems.

We located the SYNERGY Center and the Faculty Development Lab adjacent to one another and added the faculty machines to the network. This setup has allowed easier faculty access to the systems for evaluation of materials and training.

We are finding that many faculty are becoming more interested in the use of technology in the classroom. The Math Division chair is very interested and will be taking the lead next year by teaching a class in the lab in the fall.

Students used the facility in most cases *more* than asked or required to by their instructors. We found that the students really liked the lab and most felt it was helping them to learn.

Where to from Here?

The SYNERGY Center was scheduled to be open during the summer of 1993, with a few instructors using it on an informal basis. The Faculty Development Lab was similarly scheduled to be open for faculty to continue to preview software, as well as to develop their own materials.

We have targeted several instructors who are planning to do studies in 1994. We hope to solve some of the problems we came across this year and provide them with more support and materials, although budgets are extremely tight. We hope next year to really get these instructors through the *assimilation/accommodation stages* and on to the *adoption stage*, and do more comprehensive and better studies.

Miami-Dade Community College Wolfson Campus SYNERGY Center

George Alexander is the Director of Planning and Effectiveness at Miami-Dade Community College, Wolfson Campus. After attending Oxford University on a Rhodes Scholarship, he spent twelve years as a faculty member and department head at the University of West Indies. At the University of Miami, he completed a Master's degree and PhD. (1986), and directed curriculum in an innovative training program (Microcomputer Education for Employment of the Disabled-MEED) at the University's Microcomputer Institute. Subsequently, in 1991, he was appointed Director of Planning and Effectiveness for the Wolfson Campus of Miami-Dade Community College.

Information about Wolfson Campus

Wolfson Campus occupies a 9-acre site in the heart of downtown Miami and is the only urban campus in the Greater Miami area. Since opening its doors in temporary quarters in 1970, it has served as the main source of further education for immigrants and refugees arriving in Dade County. Wolfson Campus has the largest bilingual education program in the country with classes at the College's outreach center in Little Havana. The atmosphere of Wolfson Campus is cosmopolitan and international.

The campus has become known for its literary and artistic offerings. The New World School of the Arts, a joint program with the Dade County Public Schools and Florida International University, is housed on the campus. Miami Book Fair International, the largest literary event in the nation, occurs here. Wolfson Campus provides a full range of professional programs including business, architecture, and the sciences, and the only Legal Assistant program in Dade County that is approved by the American Bar Association.

In Fall Term 1992, Wolfson Campus enrolled 12,322 credit students or 23% of the College-wide enrollment. Most students were female (59%) and part-timers (65%). About 28% were over 30 years of age. Wolfson has traditionally had the highest percentage of students who are Hispanic - 69% in Fall 1992. An additional 14% were Black non-Hispanic. Wolfson has a thriving English as a Second Language program, and 22% of new students began in ESL. An additional 61% tested as academically underprepared in at least one area.

SYNERGY Center Studies

Recent experience on the SYNERGY project has taught that implementation goes beyond the buying of hardware and software, the setting up of a lab, and the selection of teachers. All these processes are important and, indeed, time and great care must be given in doing them. However, there are some hidden traps, and ignorance of them or inattention to them can, and most likely will, sabotage the best intentions of those initiating the project. There are at least five factors, any one of which can seriously jeopardize the success of the project.

These are as follows:

- The The insecurity of those faculty that are not computer literate;
- the inappropriateness of the software selected;
- the late arrival of the software and/or the hardware;
- the unavailability of the hardware due to breakdowns; and
- student underpreparedness.

Insecurity of the Non-Computer Literate Faculty

- The non-computer-literate teachers feel very threatened by an environment where they are not totally in charge of the classroom. Some teachers retreat into a position where they say they are more comfortable without the computer because they are able to take the class more quickly in the direction that they want to. They may make the excuse that the computer's inflexibility inhibits creativity in their teaching. But both can co-exist and complement one another. However their excuse gets reinforced when glitches with hardware or software occur, and they cannot solve them quickly. They feel either threatened or, at best, harried. As an antidote to this, counseling and training before the fact works very well. Adequate time should be allowed for teachers to practice privately with the machines and with any particular software package that is acquired. It should also be possible for teachers to receive peer tutoring so that they can acquire the skills without any loss of face. Equally important is to have a lab assistant who can fix the glitches in the SYNERGY Center at all times.

Inappropriateness of the Software

- Very often it is difficult to know before the fact what the needs of the class are. It is certainly difficult, even after the fact, to match the needs of the class with the actual level of instruction and skills testing that the software delivers. Attempts should be made to involve all the teachers and to consult with them before purchasing software. In our case, the software came bundled with hardware and both came as part of a grant. When the software proves inappropriate or inadequate to meet students' needs, the level of frustration will rise, both with the teacher and with the students. The project could, in fact, be sabotaged by this. Often the computers are abandoned at that stage, and the teacher uses other resources to keep the class going. It is important never to close the book on software selection, but always to have one or two teachers searching for other alternatives and communicating findings to the other teachers and to the administrators.

Lateness of Hardware or Software

- Needless to say, if either hardware or software arrives after the beginning of the term, the project is dead for that term. However, even less severe delays can have other subtle effects. Training time can be reduced, thus leaving the teachers harried or insecure. It is best to allow a much longer lead time as well as a test period of at least one semester. Deliveries should be scheduled to ensure that all elements of hardware and all packages of software arrive before that test period begins.

Hardware Breakdowns

- Hardware breakdowns are unavoidable, but every effort should be made to minimize them. There should always be a full-time staff member available to take care of such situations, to resolve the minor glitches, and to quickly substitute, or adapt, in the case where equipment has to be sent out. Wherever the budget allows, spares should be ordered. A word here about printers. It is often the case that savings are made through the sharing of printers, but, especially in writing classes, this practice could be shortsighted. There should certainly be enough printers to avoid the bottlenecks that occur at the end of the class when all students want to print.

Student Underprepardness

- Students who come into the class underprepared are at a tremendous disadvantage because they are not only learning the subject matter, but also attempting to learn the rudimentary aspects of keyboarding or computing. This puts an undue strain on them, especially the devel-

opmental students. It is best that the prerequisites be clearly stated during registration and advisement and students be required to have some working knowledge of computers and some keyboarding skills. Where this is not possible, and even otherwise, the early weeks of the class should have a much stronger lab component.

All these steps do not guarantee success. But the removal of the obstacles do, in fact, enhance the likelihood that many of the advantageous effects of teaching basic skills through computers will not be mitigated by other circumstances. It is hoped that revealing these hidden traps will go a long way toward avoiding them and thereby enhancing the outcomes of using the SYNERGY Lab.

In the case studies that follow, some information about the setting, design, monitoring, and outcomes is repeated so that each study can stand complete by itself.

Use of DESKlab for Reading

Jessica Carroll is an Assistant Professor, Language Arts, at Miami-Dade Community College, Wolfson Campus. She has been with the Wolfson Campus English Department for fifteen years. She received her B.A. in Elementary Education and her M.S. in Adult Education and Reading Education from Florida International University in 1979, 1982, and 1990 respectively.

The Setting

Two sections of REA 0002 were used in the pilot study. The usual method of instruction was not altered for one section and the students served as the control group. Another section was taught using the SYNERGY Center and these students served as the experimental group.

About the Students

The experimental group started out with 20 students. Five students dropped out and 1 moved to another level to leave a final group of 14. While 25 students started out in the control group, 5 students dropped the course, and 2 students moved to another level leaving 18.

About the Software

Please see a description of DESKlab provided in Appendix D.

The Design

For developmental courses at M-DCC, faculty use a 3-point scale in awarding grades to students: S - Satisfactory, P - Progress, and U - Unsatisfactory. Some students withdraw from the course and they receive a W. Grading was done at three separate stages — during the first half of the course, just after midterm, and at the end of the course.

This arrangement established a mechanism for determining any effects if there were differences in performance between experimental and control groups at the start of the study. We could compare performance early on as well as later. This is *not* really a comparison of progress over the semester, but rather three separate cross-sectional views of performance at different stages, comparing the performance of the control group with that of the experimental group (those taught using the SYNERGY Center).

Monitoring the Study

As the students worked through the CSR modules, some were very successful in achieving passing scores on the pretest and exercises that allowed them to move to another skill. I found the Level IV courses to be limited and not representative of the level of this particular reading class. However, during the semester (approximately at midterm), Level V was introduced with the management system. Level V courses were challenging for the students and related directly to the skills they needed to improve their reading abilities.

The lab time for this particular class immediately followed the class itself. For some students, spending two hours in a computerized setting was undesirable. Because the class was not assigned a lab instructor, most of the students were given outside assignments when they were supposed to work with the software. In order for the lab component to be effective, classes that have a lab component should be scheduled when there is supervision.

Student Outcomes

Results are presented below. The measure of the performance of the class is the number (or percentage) of students in each of the grading categories: Satisfactory (S), Progress (P), or Unsatisfactory (U). The larger the number of students in the higher categories (such as S), the better the performance.

At the final assessment, 3 students in the experimental group (out of 14 remaining) received a passing grade of S. From the control group, 7 students out of 18 got an S. The table below compares the performance of experimental and control groups at the different points in the semester. To make comparisons easy, the frequency figures used in computing percentages in all instances is the total number that started the class.

Table I

Grade Distribution

Class/Grade	*Satisfactory*	*Progress*	*Unsatisfactory*	*Withdrawal*
Early Test				
Experimental Group N=19	78%	-	5%	N/A
Control Group N=26	83%	13%	-	N/A
Midterm				
Experimental Group N=19	47%	21%	5%	N/A
Control Group = 26	42%	35%	4%	N/A
Final				
Experimental N=19	16%	53%	5%	26%
Control Group = 26	31%	42%	4%	23%

Use of DESKlab for Reading

Joyce Crawford is Associate Dean of the School of Communication at Miami-Dade Community College, Wolfson Campus. She has been with Miami-Dade for fifteen years. She has a B.A. in English Education from Florida Atlantic University (1969) and M.S. degrees in English Communication (1974) and Reading (1978), both from Florida International University. She has an Ed.D. in Communication Instruction (1993) from the University of Florida.

The Setting

Only one section of REA 1103 was used in this pilot study. The section was taught using the SYNERGY Center and the students served as an experimental group. The standard texts for the course were *Breaking Through College Reading* by Brenda D. Smith and *Contemporary Vocabulary* by Elliott Smith.

About the Students

Students entering M-DCC take the Florida MAPS placement test. Based on that score, they are placed into Reading 1105, or they may progress from REA 0002 to REA 1105. The exit criteria for REA 1105 is mastery of roughly 2/3 of the test or a raw score of 30 out of 45 items. If a student does not achieve a raw score of 30, he or she is not eligible to pass the course.

About the Software

Please see a description of DESKlab provided in Appendix D.

The Design

Students are pretested in class with the Descriptive Tests of Language Skills (DTLS). This is a college-level test developed by The College Board.

At midterm students are tested with the same form of the test to monitor progress.

For the final exam, students are given an alternate form of the DTLS. The department has identified a raw score that is necessary to pass the course (30). At this point, students are assigned a letter grade of A-F for the course.

For this course, a 4-point scale is used in awarding grades to students. Grades range from a high of A, through B, C, and D or F (both of which indicate failure). In addition, some students drop out/withdraw and receive a W.

Grading was done at three separate stages: (1) during the first half of the course, (2) just after midterm, and (3) at the end of the course.

This is *not* really a look at progress over the semester, but rather three separate cross-sectional views of performance at different stages.

Monitoring the Study

Characteristically, students completed selected assignments from both texts as part of their homework, and selected skills, readings, and concepts were incorporated into the daily classroom lesson. In addition to the two texts mentioned, students were introduced to CAI via EDL's *Reading Strategies* and *Quantum Reading Series*. Students were also introduced to CSR programs in reading. After I deemed that the students were comfortable with the computer (about 1 hour), I extrapolated a reading grade-level from their pretest scores and assigned them to a level in the EDL material. For the CSR material, students were assigned specific skill areas based on results from coursework.

With the EDL material, students began to feel successful because they were working on their own levels and no one was rushing them to complete a section. Many of the students came

worked on the skill exercises (Tach X and Word Study) and found these exercises as challenging and stimulating as a game. I am sure that as a byproduct, eye fixations and attention to detail improved, along with some other skills. As an instructor, one is always concerned that reading selections be of interest to students. Students were able to select any one of ten stories on this level to start to work. Given the degree of excitement, freedom, and sense of control I watched evolve in my students, one would think I had declared a holiday or had given them something of great value. They did not consider the selections trite or boring. On the contrary, many students remembered the selections or similar stories in their native languages, or they were intrigued enough to select follow-up materials or novels on the same subject.

The information on reading words per minute brought smiles and frowns, but it proved to be very revealing information for students. One of the course competencies is to improve reading rate by 50 words per minute (no expectation beyond 350). Of course, students learned that one can quickly reach a point of no gain, i.e., speed but no comprehension. After some adjustments, students learned reading flexibility instead of just the notion of speed. The experiments and exercises we tried would not have been possible without the computer and well-designed, interesting reading material such as we used from EDL.

As students repeatedly scored 80% or better on a level, they were promoted to the next level. Just the sense of accomplishment alone that my students verbalized made our use of CAI well worth the investment. Student scores on the pretest ranged from 15 to 33. At midterm, the scores ranged from 13 to 32. At final exam time, the scores ranged from 20 to 40.

Student Outcomes

Results are presented below. The measure of the performance of the class is the number (or percentage) of students in each of the grading categories, A, B, C, or D (fail). The larger the number of students in the higher categories (such as A), the better the performance.

Originally, I was concerned about 7 of the 18 students. Based on their pretest scores and initial coursework, I felt those students would have difficulty meeting the exit criteria. Of the seven, one passed the final with a 31, 1 dropped, 1 had baby-sitter problems and stopped attending and was given an incomplete grade. One student registered but never attended. He should have been dropped from the roll. In essence, my original group of 7 became a viable group of 5. Out of that group, 3 passed the course.

Among the other students, 3 earned A grades. These students worked diligently on the computer material and even improved their reading rates with the EDL material. One student received a B grade, and one student received a C grade. Two students received D grades. However, one met the exit criteria with a final exam score of 36 and coursework grade average of B. However, he did not give his book report (oral discussion of a novel). If he makes up the book report, which he can still do, his grade will be changed to a B. The other student also passed the final exam with a score of 33 but failed to give his book report. His grade would have been a C.

One student received an F grade because he stopped attending before midterm; he had to take care of his grandmother. Two students received I grades. One passed the final exam with a score of 33. He needed the class to qualify to take the CLAST exam. He continued to work on the CAI material to enhance his chances of passing the CLAST exam in reading. His grade will be changed to a B. The other student worked in a full-time job and had trouble making it to class. She passed the final with a 30 but missed too many other assignments to receive a grade. She is making up the work now and will receive a C grade.

Students who were eventually successful all worked extensively on CAI material. The table below shows the percentages of different grades at the different points in the semester. To make comparisons easy, the frequency figures quoted in all instances are percentages of the total number that started the class.

Table 1

Grade Distribution

Class/Grade	*A*	*B*	*C*	*Failed*	*Withdrawal*
Early Test					
Experimental Group N=18		22%	33%	33%	N/A
Midterm					
Experimental Group N=18	5%	11%	17%	56%	N/A
Final					
*Experimental N=17**	17%	11%	22%	39%	11%

*One student had an incomplete grade

Use of DESKlab for Reading

Barbara M. Golphin is the Lab Manager, Multi-Skills Laboratory, at Miami-Dade Community College, Wolfson Campus. She has been with the Wolfson Campus Communications Department for six years. She received her B.A. in Journalism from Clark College, Atlanta, Georgia. She is currently pursuing a Master of Public Administration degree at Florida International University, Miami, Florida.

The Setting

Two sections of the instructors' REA 0001 course were used in the pilot study. The usual method of instruction was not altered for one section and the students served as the control group. Another section was taught using the SYNERGY Center and these students served as the experimental group.

About the Students

The experimental group started out with 19 students. Three students dropped out to leave a final group of 16. While 25 students started out in the control group, 5 students dropped the course, again leaving 20. Both groups had poor vocabulary skills.

About the Software

Please see a description of DESKlab provided in Appendix D.

The Design

For developmental courses at M-DCC, faculty use a 3-point scale in awarding grades to students: S - Satisfactory, P - Progress, and U - Unsatisfactory. Some students withdraw from the course and they receive a W. Students in both groups received the same handouts and homework assignments from the textbook and other resources. Some class topics were not covered in the available computer programs (for example, skimming and scanning news articles). Grading was done at three separate stages — during the first half of the course, just after midterm, and at the end of the course.

This arrangement established a mechanism for determining any effects if there were differences in performance between experimental and control groups at the start of the study. We could compare performance early on as well as later. This is *not* really a comparison of progress over the semester, but rather three separate cross-sectional views of performance at different stages, comparing the performance of the control group with that of the experimental group (those taught using the SYNERGY Center).

Monitoring the Study

It is an excellent idea to use computers to support an instructor's teaching method. The computerized exercises help to improve the students' skills by allowing them to work individually at their own speeds.

The Level IV CSR modules that came with DESKlab were compatible with the topics covered in the course. I liked the CSR format, i.e., a pretest, a tutorial, practice exercises, and a posttest component. But the lessons were rather easy and perhaps should be combined to make them more challenging for the students. Students did not find it difficult to get used to the program. The students worked fast with the CSR lessons and some were ahead of the course outline followed in the classroom.

After the midterm, students started using EDL's *Quantum* program, which offered controlled reading, an excellent feature for assisting students with reading problems.

I monitored the lab performance of both groups and discussed their progress with their lab in-

structors. The students in the SYNERGY Center were more enthusiastic about their assignments, submitted them on time, understood the concepts, consistently participated in class discussions, and prepared and presented better book reports than did the students in the regular class.

The students enjoyed the exercises, requested additional and challenging lessons, and appreciated being able to work at their own speed with the controlled reader of the *Quantum* program. They requested additional lab time during their spare time.

Initially, there were more students than computers in the SYNERGY Center, but one student transferred to another class after my request. The students also had problems printing out their book reports and forms. I assumed that the lab would be available for students to use during additional hours (not including lab or classroom time).

Student Outcomes

At the final assessment, 9 students in the experimental group (out of 16 remaining) received a passing grade of S. From the control group, 5 students out of 20 got an S. The table below compares experimental and control groups at the different points in the semester. To make comparisons easy, the frequency figures quoted in all instances are percentages of the total number that started the class. Results are presented below. The measure of the performance of the class is the number (or percentage) of students in each of the grading categories, Satisfactory (S), Progress (P) or Unsatisfactory (U). The larger the number of students in the higher categories (such as S), the better the performance. When the final class grade is compared for the two groups, the experimental group showed a higher success rate and lower withdrawal rate than did the control group. The experimental group showed better results in these two critical measures of performance.

Table I

Grade Distribution

Class/Grade	*Satisfactory*	*Progress*	*Unsatisfactory*	*Withdrawal*
Early Test				
Experimental Group N=18	56%	33%	-	N/A
Control Group N=23	35%	52%	4%	N/A
Midterm				
Experimental Group N=18	78%	11%	-	N/A
Control Group = 23	65%	26%	-	N/A
Final				
Experimental N=18	50%	39%	-	11%
Control Group = 23	22%	65%	-	13%

Use of DESKlab for Reading

Marjorie Sussman is an Associate Professor at Miami-Dade Community College, Wolfson Campus. She has been with the Wolfson Campus Communications Department for five years. She received her B.S. in Elementary Education from the University of Vermont and State Agriculture College in 1966 and her M.S. in Generic Special Education from Framingham State College in 1985.

The Setting

Two sections of REA 1105 were used in the pilot study. The usual method of instruction was not altered for one section and the students served as the control group. The other section was taught using the SYNERGY Center and these students served as the experimental group.

About the Students

The experimental group started out with 17 students. Four students dropped out to leave a final group of 13. Twenty-seven students started out in the control group. Ten students dropped the course, again leaving 17.

About the Software

Please see a description of Desklab provided in Appendix D.

The Design

Two REA 1105 (college-level reading) sections were taught on Tuesdays and Thursdays (1 hour, 15 minutes each meeting). Both used *Breaking Through College Reading* (Harper Collins) as the primary text. Supplemental vocabulary packets were also provided. Initial diagnostic testing was administered using the Descriptive Test of Language Skills (DTLS). The same test was used as a midterm exam, and a different form was administered for the final. Informal, teacher-made vocabulary quizzes and comprehension tests were administered throughout the semester. Both classes had identical homework assignments. To pass the course, students were required to have a C average on all classwork/homework/quizzes and a minimum score of 30 on the DTLS. The final grade was computed on the basis of weekly comprehension and vocabulary tests, homework assignments on selected reading and vocabulary, a book report, DTLS score, and class participation/attendance.

For this course, a 4-point scale is used in awarding grades to students. Grades range from a high of A, through B, C, and D or F (both of which indicate failure). In addition, some students withdraw and receive a W.

Grading was done at three separate stages — during the first half of the course, just after midterm, and at the end of the course.

This arrangement established a mechanism for determining any effects if there were differences in performance between experimental and control groups at the start of the study. We could compare performance early on as well as later. This is *not* really a comparison of progress over the semester, but rather three separate cross-sectional views of performance at different stages, comparing the performance of the control group with that of the experimental group (those taught using the SYNERGY Center).

Monitoring the Study

The students and I were excited to be in a classroom in which we could make use of a computer to help develop reading skills. We all approached the challenge positively. But as the semester went on, the students and I became frustrated with the programs available. The lack of computer familiarity on the part of many of

the students interfered with their work. Typing skills, or the lack thereof, seemed to hinder the students' ability to focus on the main task — improving reading. However, students appeared to enjoy working on the computer, although they felt that it was not adequately helping them improve their reading skills. They had difficulty following directions for computer use, and the instructor had to constantly monitor students individually to make sure they were correctly using the program. Class time for the first half of the semester was divided between the textbook information and the computer work - 2/3 text and 1/3 computer work. Another obstacle was the printer: students had problems printing their documents, which directly affected the amount of time they could use for actual computer/classwork.

These problems prompted me to virtually eliminate the computer as part of my classroom instruction after the midterm exams, as I felt it was hindering rather than helping the students improve their reading comprehension skills. I felt frustrated that critical-thinking skills were minimally addressed in this class as I needed to "find" time to allow students to work on the computer. There were not sufficient programs in specific skill areas, i.e. main idea and supporting detail, at appropriate multilevels, to adequately prepare students to pass the class.

The SYNERGY Center is a great concept which, I believe, requires further study so that it can become an effective tool to aid our students in their acquisition of knowledge. I believe the main reason for the negative feeling toward computer-assisted instruction was the lack of sufficient programs. If I had access to specific skill programs on multilevels, I would have been able to let each student work at his/her own level while focusing on each specific skill needed to efficiently and effectively read.

Student Outcomes

At the final assessment, 7 students in the experimental group (out of 17 remaining) received a passing grade (A, B, or C). From the control group, 12 students out of 27 got an A, B, or C. The table below compares the grades of experimental and control groups at the different points in the semester. To make comparisons easy, the frequency figures quoted in all instances are percentages of the total number that started the class. Results are presented below. The measure of the performance of the class is the number (or percentage) of students in each of the grading categories — A, B, C, D, or F. The larger the number of students in the higher categories (such as A), the better the performance.

Table 1

Grade Distribution

Class/Grade	*A*	*B*	*C*	*Failed*	*Withdrawal*
Early Test					
Experimental Group N=17	-	-	29%	59%	N/A
Control Group N=27	4%	19%	44%	22%	N/A
Midterm					
Experimental Group N=17	-	6%	41%	41%	N/A
Control Group = 27	4%	19%	37%	19%	N/A
Final					
Experimental N=17	-	12%	29%	35%	24%
Control Group = 27	7%	22%	15%	15%	41%

Use of DESKlab for Writing

Sandra M. Castillo is an instructor of Language Arts at Miami Dade Community College, Wolfson Campus. She has been with the Wolfson Campus Communications Department for four years. She received her B.A. and M.A. in English from Florida State University in 1985 and 1988 respectively.

The Setting

Two sections of ENC 1130 were used in the pilot study. The usual method of instruction was not altered for one section and the students served as the control group. Another section was taught using the SYNERGY Center and these students served as the experimental group.

About the Students

The experimental group started out with 20 students. 3 students dropped out to leave a final group of 17. Twenty-six students started out in the control group; 4 students dropped the course and 1 student moved to another level leaving 21.

About the Software

Please see a description of DESKlab provided in Appendix D.

The Design

For the pretest and midterm test, a 3-point scale was used in assessing students' progress: S - Satisfactory, P - Progress, and U - Unsatisfactory. For this course, a 4-point scale is used in awarding final grades to students. Grades range from a high of A , through B, C, and D or F (both of which indicate failure). In addition, some students drop out/withdraw and receive a grade of W. Grading was done at three separate stages -- during the first half of the course, just after midterm, and at the end of the course.

This arrangement established a mechanism for determining any effects that would result if there were differences in performance between experimental and control groups at the start of the study. We could compare performance early on as well as later. This is *not* really a comparison of progress over the semester, but rather three separate cross-sectional views of performance at different stages, comparing the performance of the control group with that of the experimental group (those taught using the SYNERGY Center).

Monitoring the Study

Initially, I was rather apprehensive because I was concerned about the questions that the students might ask, and given my nonextensive computer experience, this was something I looked at as an obstacle. But with the help of the lab assistant, things began to fall into place.

Between the two of us, I think the students began to feel much more comfortable with their own inexperience, and that was indeed comforting. The transition between "What do you mean this is a computerized 1130 class?" and "Wow, this is really neat!!" was quite wonderful. That alone made me feel like change was possible.

After being introduced to DESKlab, we started with CSR Level IV, then moved to Microsoft Works, in which students were required to compose and write a complete essay. I discovered that CSR Level IV was not challenging enough for the students in this

class. Based on this, I requested that we purchase the Level V course, which we received during the semester. This was also easy for the students, but it could be used more effectively in the lab setting. In the class, I did not find the modules any more useful than the previous skills, at least not for ENC 1130. Students were not connecting the grammar with the writing because they went through the skills so easily.

We experienced quite a few technical difficulties that made the class run at a slower pace. It was especially problematic when it came time to print. It might be rather useful to have a permanent lab assistant working with us in the SYNERGY Center to solve our technical problems. I can confidently say that I am very interested in the possibilities that will continue to emerge with practical usage.

Despite the growing trend toward computer literacy, there are quite a few students who are not quite ready to face the computer/technology frenzy. For this reason, and for problems (little problems) that can come up given certain students' reluctance to face the challenges computers present, I feel that students for the experimental group should be screened. That is, they should come in *knowing* that they will be required to work on a computer. We can also screen students not only according to their interests but also according to how they learn.

Overall, I am pleased with our improvement and, as we move on and implement changes, I know we will iron out all the wrinkles. I hope that I will continue to be involved with the project and that I might be able to assist with the research via my suggestions.

Student Outcomes

Results are presented below. The measure of the performance of the class for early and midterm exams is the number (or percentage) of students in each of the grading categories: Satisfactory (S), Progress (P), or Unsatisfactory (U). The larger the number of students in the higher categories (such as S), the better the performance. A 4-point scale is used in awarding final grades to students. Grades range from a high of A, through B, C, and D or F (both of which indicate failure). Students who withdrew were given a grade of W.

The table below compares the performance of students in experimental and control groups at different points in the semester. To make comparisons easy, the frequency figures quoted in all instances are percentages of the total number that started the class.

Table I
Grade Distribution

Class/Grade	*Satisfactory*	*Progress*	*Unsatisfactory*	*Withdrawal*
Early Test				
Experimental Group N=20	30%	65%	-	N/A
Control Group N=26	26%	65%	-	N/A
Midterm				
Experimental Group N=20	15%	80%	-	N/A
Control Group = 26	42%	50%	-	N/A
Final				

Class/Grade	A	B	C	Failed	*Withdrawal*
Experimental N=20	-	20%	5%	50%	25%
Control Group = 26	4%	23%	8%	46%	19%

Use of DESKlab for Writing

Jamaye Despaigne is an instructor of English at Miami-Dade Community College, Wolfson Campus. She has been with the Wolfson Campus Communications Department for three years. She received her B.A. in Elementary Education from Hampton University and her M.A. in English from Kansas State University in 1990.

The Setting

Enc 0020 is a basic writing course in the College Prep area of the Communications Department. Students spend half their class time reviewing grammar skills and the other half writing developed paragraphs. Two sections of this course were used in this pilot study. The usual method of instruction was not altered for one section and the students served as the control group. The other section was taught using the SYNERGY Center and these students served as the experimental group.

About the Students

The experimental group started out with 20 students. Five students dropped out to leave a final group of 15. Twenty-three students started out in the control group. Eight students dropped the course, again leaving 15.

Students in the experimental group seemed to be especially underprepared and unmotivated. They were generally quiet and reserved in their class participation. Students in the control class seemed to be better prepared overall, as a group, for the class. Their skills from the outset seemed stronger. Students in the control class seemed to be more verbal, excited, and interested in the class. They were active in classroom discussions and seemed to do homework assignments.

About the Software

Please see a description of DESKlab provided in Appendix D.

The Design

Students must pass a midterm grammar test with a score of 80% in order to be eligible to take the final exam. The departmental final is a 90-minute timed writing exam in which the student must demostrate mastery of applied grammar skills and paragraph development. Students are asked to write one developed paragraph of 12-14 sentences.

For developmental courses at M-DCC, faculty use a 3-point scale in awarding grades to students: S- Satisfactory, P - Progress, and U - Unsatisfactory. Some students withdraw from the course and they receive a W.

Grading was done at three separate stages — during the first half of the course, just after midterm, and at the end of the course.

This arrangement established a mechanism for determing any effects if there were differences in performance between experimental and control groups at the start of the study. We could compare performance early on as well as later. This is *not* really a comparison of progress over the semester, but rather three separate cross-sectional views of performance at different stages, comparing the performance of the control group with that of the experimental group (those taught using the SYNERGY Center).

Results are presented below. The measure of the performance of the class is the number (or percentage) of students in each of the grading categories: Satisfactory (S), Progress (P), or Unsatisfactory (U). The larger the number of students in the higher categories (such as S), the better the performance.

Monitoring the Study

I prepare students for both exams by providing instruction, drill, and practice. Students normally use handouts and their text for drills, while the text is also used for writing. This is what I used in my control group and in the SYNERGY Center. I used the same grammar handouts but gave them additional applied grammar writing assignments (just freewriting to get them used to using the computer and practicing composing on the computer from the beginning of the semester). SYNERGY Center students did get additional grammar skills work in the lab that the control group did not have access to. Additionally, SYNERGY Center students did have the benefit of having the same lab instructor and being together as a class in the lab, whereas the control group was dispersed to a number of lab instructors in the traditional lab.

Students in the SYNERGY Center seemed to be in control of their own learning, they seemed content while working individually on their computers, and they asked for assistance when needed. I acted more as a coach and resource person at times, responding to individual questions on different assignments at different levels, depending on the progress and needs of the students. The programs we had available for student use were not challenging enough for some students (did not have a variety of levels) and were quite standard in their mode (drill and practice).

We should shy away from simply substituting the computer for chalk, pen, and ink.

Student Outcomes

At the final assessment, 10 students in the experimental group (out of 15 remaining) received a passing grade of S. From the control group, 9 students out of 15 got an S. The table below compares the experimental and control groups at the different points in the semester. To make comparisons easy, the frequency figures quoted in all instances are percentages of the total number that started the class.

Overall, a glance at the statistics below shows that the experimental group did better than the control group. I feel they did achieve at a slightly higher rate since they were less prepared than the control group and did better in their outcomes.

Table 1

Grade Distribution

Class/Grade	*Satisfactory*	*Progress*	*Unsatisfactory*	*Withdrawal*
Early Test				
Experimental Group N=20	-	25%	70%	N/A
Control Group N=23	-	23%	73%	N/A
Midterm				
Experimental Group N=20	10%	60%	20%	N/A
Control Group = 23	5%	59%	9%	N/A
Final				
Experimental N=20	50%	35%	-	15%
Control Group = 23	39%	21%	4	35%

Use of DESKlab for Writing

Ernest Talavera is an instructor of English at Miami-Dade Community College, Wolfson Campus. He has been with the Wolfson Campus Communications Department for eight years. He received his B.A. from the University of Miami in 1982 and M.S. from Florida International University in 1991.

The Setting

Two sections of ENC 0002 were used in this pilot study. The usual method of instruction was not altered for the control group, while the experimental group was taught using the SYNERGY Center.

About the Students

The experimental group started with 20 students. One student moved to another level to leave a final group of 19. Four of the remaining students in this group were enrolled for the second time in this course. The control group started with 25 students. Eight of these students were also retaking the course. Only one student dropped the course.

About the Software

Please see a description of DESKlab provided in Appendix D.

The Design

For developmental courses at M-DCC, faculty use a 3-point scale in awarding grades to students: S-Satisfactory, P-Progress, and U-Unsatisfactory. Students who withdraw from the course usually receive a W.

Grading was done at three separate stages — during the first half of the course, just after the midterm, and at the end of the course. Both groups took the exams in their respective classrooms under the same conditions.

This arrangement established a mechanism for determing any effects if there were differences in performance between experimental and control groups at the start of the study. We could compare performance early on as well as later. This is *not* really a comparison of progress over the semester, but rather three separate cross-sectional views of performance at different stages, comparing the performance of the control group with that of the experimental group (those taught in the SYNERGY Center).

The measure of the performance of the class is the number (or percentage) of students in each of the grading categories — Satisfactory (S), Progress (P), or Unsatisfactory (U). The larger the number of students in the higher categories (such as S), the better the performance.

Monitoring the Study

In seeking an alternative way of assisting students, I started with CSR Level IV writing modules that came with DESKlab. This did not seem challenging enough for the students as they were able to pass most of the pre-tests for each module. Following this initial try-out, I requested CSR Level V courses, which came toward the midterm. This delay in purchasing Level V modules caused breaks in grammar continuity. By being provided Level V modules and the CSR management system, we were able to order and organize CSR modules for each student.

When students started using DESKlab's word processor (Microsoft Works) to write, I discovered that they did not have sufficient time to complete their essays and proofread their drafts during one class period. But as the semester progressed, most were able to proofread their writing on the screen, thus saving time.

Student Outcomes

At the final assessment, 7 students in the experimental group (out of 19 remaining) received a passing grade of S. From the control group, 12 students out 24 got an S. The table below compares the performance of experimental and control groups at different points in the semester. To make comparisons easy, the figures quoted in all instances are percentages of the total number that started the class.

Table 1

Grade Distribution

Class/Grade	*Satisfactory*	*Progress*	*Unsatisfactory*	*Withdrawal*
Early Test				
Experimental Group N=19	5%	89%	5%	N/A
Control Group N=25	12%	80%	8%	N/A
Midterm				
Experimental Group N=19	42%	26%	32%	N/A
Control Group=25	56%	20%	20%	N/A
Final				
Experimental N=19	32%	63%	-	5%
Control Group=25	48%	40%	8%	4%

Richland College SYNERGY Center

Lolita W. Gilkes, Project SYNERGY Software Implementation Designer, has been supervising the Educational Computing Laboratories at Richland College for the past two years. Additionally, she has taught Introduction to Computers, Database Applications, and classes in the Faculty Support and Multimedia Center. She has also worked as an educational software consultant and author for the past ten years. She has degrees from Boston University and the University of Texas at Dallas and is currently working on a Ph.D. in Information Science at the University of North Texas.

Richland College, one of the seven colleges of the Dallas Community College District, spent the Spring Semester 1993 preparing for our implementation of Project SYNERGY in the fall of 1993. Our SYNERGY team of math, reading, and writing faculty members met regularly with the coordinator of the Campus Testing Center, the Director of the Tutoring Center, and Educational Computing Laboratory personnel to discuss our questions and ideas regarding the use of computers in testing and remediation.

Our group took two field trips to visit campuses with extensive computer facilities supporting their remedial programs. We spent a day at St. Phillip's College in San Antonio, and a day at Austin Community College in Austin, Texas. Our dialogues with the faculty at these campuses and our examination of their hardware, software, and lab setups was most beneficial. We were extremely impressed by the enthusiasm, dedication, and successes of the teachers involved in computer-assisted remediation.

Throughout these preparatory months, we also spent considerable time reviewing and evaluating software that might support our program. We are convinced that the quality of the software we choose to use is as critical to our success as are the teachers and our design methodologies. The consensus of our team was that the software currently available does not meet our expectations. Our observation is that the design of published software has not changed significantly in the last decade and it does not adequately tap the potential of the computer as a resource tool. Therefore, we have undertaken a significant development project to supplement the software that will be available to use with DESKlab.

In the area of developmental mathematics, our SYNERGY instructor will be using a newly released textbook with its accompanying software and videos. It is a 1993 publication whose design seems to be well conceived, so we have chosen not to undertake a development project in math at this time. Instead, we will focus on supplementing the software available for reading and writing by developing Windows-based software that takes advantage of the more intuitive graphical user interface.

One member of the team is using Toolbook by Asymetrix to develop a program that will enable students to examine other students' writings and give written response to teacher-suggested prompts. The student peer reviews will be saved on the network in such a way that the author of each paper will be able to download copies of the peer reviews if that is desired. The teacher will be able to access all of the writings and comments from his office. Only the teacher and student author will have access to the original text, an important feature that we found missing from much of the existing software.

Two member of the team are using Microsoft Visual Basic for Windows to design a reading program that will give students access to numerous texts for analysis and written response. The program includes a number of true/false and multiple-choice questions about the content

of the readings and vocabulary, and it will grade the student responses to these questions for the teacher. All of the student written responses will be evaluated by the teacher, who can access the program from her office. The design will also include the opportunity for collaborative student response to some of the discussion questions.

We are very excited about having the opportunity to prepare materials for use with our developmental students, and to test and modify the materials as necessary. We are looking forward to the implementation of Project SYNERGY in the fall, to continue our exploration and discovery into designs and methodologies to promote student learning and success.

University of Tennessee at Martin SYNERGY Center

Polly Glover, Project SYNERGY Software Implementation Designer and Coordinator of the Student Learning Center at The University of Tennessee at Martin, has substantial experience in working with faculty in developing and conducting research in teaching and learning. She successfully directed the development of the Student Learning Center under a Title III grant at the University of Tennessee. She received her B.A. in English from the Union University, Jackson, Tennessee in 1962 and her Ed.D. in Higher Administration in 1987 from Peabody College, Vanderbilt University, Nashville, Tennessee.

During the 1992-93 academic year, The University of Tennessee at Martin intensified planning for the SYNERGY Center. Throughout the year, as the UTM coordinator, I worked with several IBM representatives to develop the equipment request and to refine the agreement with IBM. The Academic Affairs Office selected an appropriate classroom for the facility, and it became available in the spring.

During the Fall Term 1992, teachers were identified and planning for the courses began. The Developmental English teacher, Jenna Wright, had reviewed writing software and was reviewing ESL software; Sharon Robertson was reviewing study skills software and would adapt her study skills course for the SYNERGY Center. Brenda Lackey, who had been involved in planning for Project SYNERGY Integrator, was selected to teach developmental mathematics. Two reading teachers, Regina Henson and Michelle Perry, also were identified. Several persons were able to spend time at Memphis State Technical Institute, examining DESKlab and discussing it with teachers. The coordinator developed and published a schedule of course offerings and lab hours for the new computer classroom. Because the fileserver and the computers had not arrived by mid-summer, classes in the SYNERGY Center may be postponed until the Spring Term 1994, in order to give teachers time to become comfortable using the DESKlab materials and the networked computers.

The teachers are enthusiastic about their involvement and will move as quickly as possible to begin their courses. Having already had very positive experiences in reviewing software and in sharing the reviews, we are now looking forward to the classroom project.

Part Three: Project SYNERGY Integrator and Platform of Neutrality

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Senior Project Analyst
Miami-Dade Community College

In 1989, the project team began listening to the faculty who teach the underprepared college students; these faculty laid out the reasons for Project SYNERGY Integrator (PSI). They asked for a standard student interface when their students move from one software package to another. They said that if they bought instructional software without a management system, they could not tell how their students were progressing, and if they wished to buy software with a management system, the cost was prohibitive. They also said that, in an ideal configuration of technological support, their students should be treated holistically and not compartmentalized into courses and fragmented into software within courses. For all these valid reasons, we decided to develop PSI. As the project team envisions *Learning Environment 2000 for Underprepared College Students*, we acknowledge that varied institutional settings exist to provide the students with instruction and support, both human and technological. Within these varied settings, the project team sees the *Project SYNERGY Environment* (presented in Part Five) as a special case. The *Project SYNERGY Environment* will include a commercially available Local Area Network (LAN), and the driving force of this network will be PSI.

PSI is designed and is being developed as an integrated, adaptive system that

- provides a computerized management system in which the students and faculty/staff feel that they are in control of the activities managed by the system.
- insures that the instructional software will conform to the project's standard for interacting with students (standard student interface).
- provides linkages among learning objectives, instructional software, and mastery tests in order for the student to have a smooth transition from one learning objective to another and from one software package to another.
- assists faculty to have a more efficient handle on how their students are progressing and to take appropriate action.

- incorporates Project SYNERGY learning objectives, mastery testing, standard options for placement and diagnostic tests, and installation options for other testing and instructional software in order for an institution to install and use the system more quickly than it otherwise would.

The major components of PSI are shown in Figure 1 (page 90) and include the following:

Databases:

- User Databases
- Curriculum Databases

Connectivity:

- Student Access
- Faculty Command and Curriculum Manager
- Instructional Software Connectivity

Databases

User Databases. The heart of PSI is the set of user databases it maintains and the linkages among them. The *student database* contains information about each student and his/her progress. It is configured to allow a student to work in multiple disciplines, in multiple courses within any discipline, and across terms and be treated as one person. The *faculty database* contains information about the faculty and staff users of the system, including areas of access and user preferences for interacting with PSI. The *course database* contains information about faculty and staff for each course, a list of students enrolled, and optional groupings of students within a course.

Curriculum Databases. The *objectives database* contains the Project SYNERGY objectives as laid out in the software review forms for reading, writing, math, ESL, and study skills/critical thinking. The *diagnostics database* contains information about the various instruments used by institutions for placement of students in courses and/or diagnosis of specific learning deficiencies. The project team is working with The College Board to include its CPT's (Computerized Placement Tests), with ETS to incorporate its GUIDES (diagnostic tests) as options in PSI, and with ACT to do the same with its COMPASS and ASSET tests. The *software database* contains mastery information on each instructional software package available to PSI. In particular, it contains information about objectives covered from among Project SYNERGY's complete list. The *testbank database* contains mastery test questions for Project SYNERGY objectives. The items for the testbank are being developed in Project SYNERGY II by teams of faculty members from the participating institutions. These questions are being entered into **Banque,** an existing computerized testbank system owned by M-DCC that will be used by PSI to generate mastery tests for students.

Linking Among Databases. Each of the databases maintained by PSI contains links to one or more of the other databases. These linkages are dynamic, being created as new components are added (e.g., a student is registered in a course, a Curriculum Plan is created, or a new software is added) and being changed or deleted as circumstances change (e.g., a student drops a course or a faculty member modifies a student's mastery test).

The records in the *student, faculty,* and *course databases* are closely linked to each other. In addition, the student's *Curriculum Plan* is linked to objectives, instructional software, and test questions. The *diagnostics database* contains links between diagnostic information and objectives. The *software database* contains links between software units or lessons and the corresponding objectives in the *objectives database.* The *testbank database* contains links between test questions and objectives in the *objectives database.*

Connectivity

Student Access. PSI responds to students through the *Learning Guide* in such a way that they feel they are at the center of the system when they are using it. The *Learning*

Project SYNERGY Integrator
Modules, Databases and Files

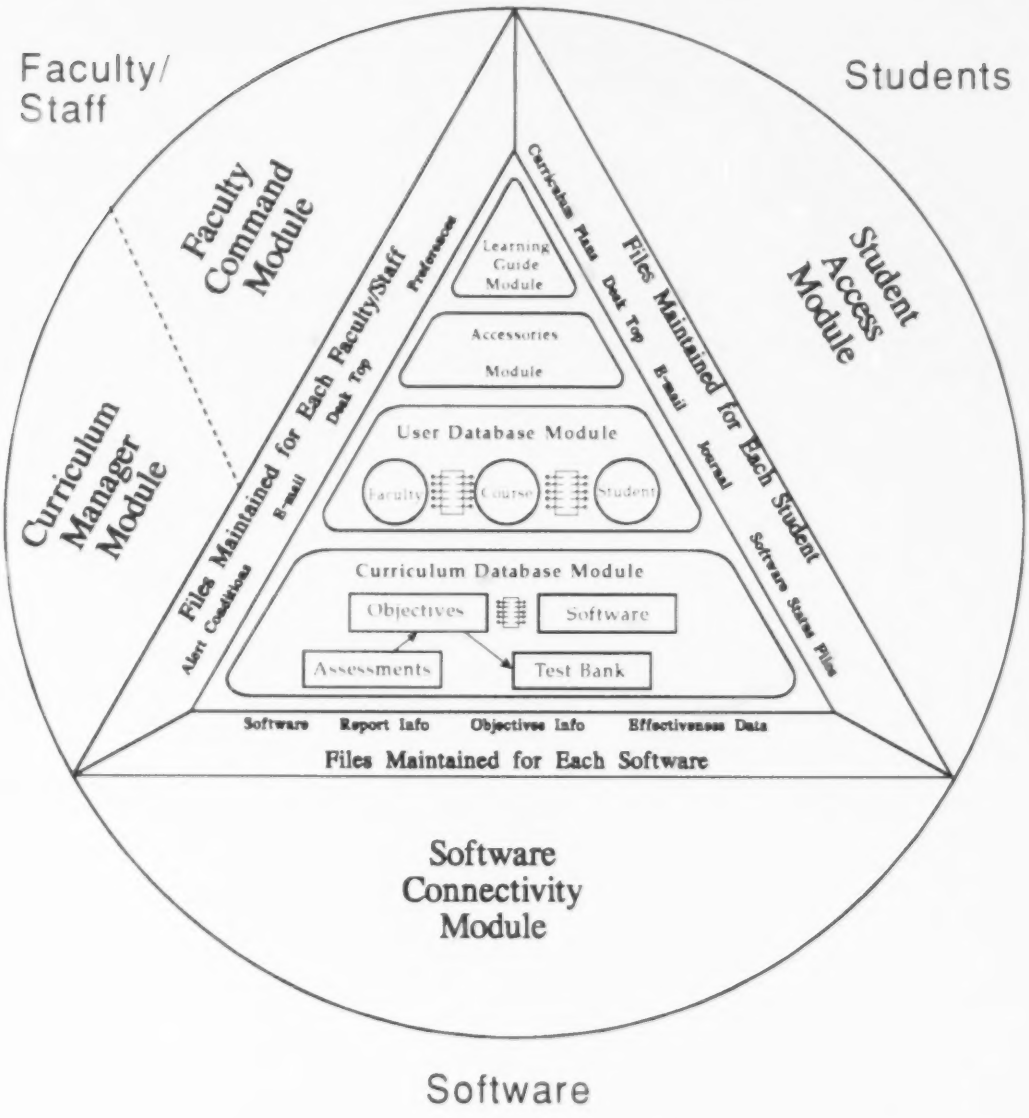

Figure 1. Project SYNERGY Integrator (PSI)

Guide is the manager of student activity in PSI, and it gives the student access to PSI. *The Learning Guide* constructs and displays a *Curriculum Plan* for each student. A student enrolled in multiple courses will have multiple curriculum plans that will be available to him/her at sign-on. The *Learning Guide* automatically creates a *Curriculum Plan* for a student as follows: based on the results of diagnostic and placement tests, it selects the objectives to be mastered from the objectives database; having selected the objectives, it selects a list of appropriate software for instruction; and it further generates periodic tests from **Banque** to assess the student's mastery of objectives. The automatic process may be modified by faculty according to their preferences.

The student may ask for help at any time. The student can send E-mail messages to faculty/staff and receive responses on-line. The system will permit a certain amount of exploration and experimentation and will offer advice when the exploration seems inappropriate. We have included in our design multi-student interaction from one terminal to accommodate collaborative learning. The student will be able to backtrack in the *Curriculum Plan* in order to improve a grade or score. In addition, the student can request that the faculty adjust the *Curriculum Plan* if he/she is having difficulty.

Faculty Command and Curriculum Manager. PSI will respond to instructors and their assistants through its *Command Module* in such a way that they feel they are at the center of the system. PSI accomplishes this by obtaining a faculty profile of how *each* faculty wishes to use the system. The options available to the faculty are presented as icons on their desktop, grouped together by function. Where necessary, the faculty will be provided prompts to move around the system and access its many functions.

After the students are registered in PSI, the faculty member who so chooses can delete students in his/her course; access student records, either singly or in groups; access students' curriculum plans to see progress; get various reports, either on-line or in print; send E-mail messages to co-workers or students; and create or modify curriculum plans. In particular, the instructor can intervene personally in the learning process for any of his/her students.

Through the *Curriculum Manager*, PSI can be highly customized, whether through the addition of objectives, diagnostic tools, software, or test items, or through the modification of curriculum plans. When such customizing has ramifications for database linkages, PSI will inform the faculty of the effects of the customizing and may even suggest the conditions under which such change may or may not be appropriate.

Instructional Software Connectivity. The *software database* contains information about objectives covered, instructional modes, modules, and other software features. This information allows PSI to create appropriate curriculum plans for each student. PSI will provide a common *connectivity mechanism* for all the software installed, initiating the software for the student, passing data to the software, getting data back from the software, and maintaining bookmarks. The database is also designed to allow for the collection of data about the usefulness/ effectiveness of the software in the real world. This data will allow the project team to make improvements in the automated operation of the system to create the curriculum plans.

In developing PSI, we aim to do for education what IBM did for the PC industry and what Microsoft did for PC applications. If we look back, we see that the PC market was floundering and moving at a snail's pace until IBM established the *de facto* open architecture standard for PC hardware, and soon after, we witnessed a big boom in the PC hardware industry. Similarly, the programming industry was floundering and moving at a snail's pace until Microsoft established the open architecture standard for Common User Access (CUA) in Windows for the programming environment. The fully implemented CUA led to a boom in PC applications. Following in the footsteps of

these two trends, we predict that PSI will give a boom to the adoption of instructional software in educational institutions because of its open architecture standard for user as well as software interfaces. By Miami-Dade's taking on this horrendous task of developing PSI, software publishers stand to gain because we provide a **platform of neutrality** on which all of us can come together and work toward a common goal.

Plans are underway to obtain an initial collection of PSI-compatible software that covers the breadth of the Project SYNERGY objectives. The project team is highly committed to forming a strong and healthy relationship with software vendors in this regard. Thus far, twelve publishers publisher have signed an agreement and three more are pending. Their names and addresses follow on the next page. (Please see Appendix C for a complete list of Project SYNERGY software publishers.) Of course, the collection will be updated continually as additional software meets PSI requirements, and we intend to publish a catalog of PSI-compatible software.

List of Software Publishers who have Signed the Software Porting Agreement for PSI

*ACT
Mr. John Roth
2201 N. Dodge St.
Iowa City, IA 52243

Addison Wesley Publishing Company, Inc.
Mr. David O'Connor
Vice President, Educational Multimedia Group
6 Jacob Way
Reading, MA 01867

*American Language Academy
Mr. John W. Myrna
Director of CALL
1401 Rockville Pike - Suite 550
Rockville, MD 20852

Daedalus Group, Inc.
Dr. Hugh Burns
1106 Clayton Lane 448E
Austin, TX 78723

Educational Activities, Inc.
Mr. Alan Stern
Vice President
1937 Grand Ave.
Baldwin, NY 11510-6377

Educational Developmental Laboratories, Inc.
Mr. Irwin Harris
President
P. O. Box 210726
Columbia, SC 29221

Houghton Mifflin Co.
Ms. Susan Soley
Manager, Software and Media Dept.
222 Berkley St.
Boston, MA 02116-3764

Kapstrom, Inc.
Mrs. Gay Dahlstrom
P. O. Box 1230
Buda, TX 78610-1230

The Math Lab
Mr. Chris Avery
5333 Elrose Ave.
San Jose, CA 95124

Maxthink
Mr. Neil Larson
2425 Channing Way #B-592
Berkeley, CA 94704-2209

Merit Audio Visual
Mr. Ben Weintraub
132 West 21 Street
New York, NY 10021

Microcomputer Curriculum Project
Mr. Lynn C. Schwandt
Vice President/Treasurer
451 Progress Ave.
Waterloo, IA 50701

Milliken Publishing Co.
Mr. Michael Moore
Telemarketing
1100 Research Blvd.
St. Louis, MO 63132

Parlance Software
Dr. Fredrick Wellington
542 South Yorktown Ave.
Tulsa, OK 74104

*The College Board
Mr. Arthur Doyle
Executive Director
College Level and State Services
45 Columbus Ave.
New York, NY 10023

*Awaiting agreement

Part Four: Project SYNERGY Environment

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In this report, we wish to introduce the concept of *Project SYNERGY Environment* and elaborate on the ingredients which make up that environment. We believe that an institution's attention to all the ingredients will greatly enhance its degree of success in introducing **technology** to support teaching and learning. *The American Heritage Dictionary* defines environment as follows: *(1) Something that surrounds; surroundings. (2) The combination of external physical conditions that affect and influence the growth and development of organisms. (3) The social and cultural conditions that affect the nature of an individual or community.* We would like to apply the last two definitions to *Project SYNERGY Environment*, although technology is not an organism, but functions as if it were.

The organism we have in mind for *Project SYNERGY Environment* is a Local Area Network (LAN) consisting of hardware and software. A LAN has the advantage of letting several terminals share the software resources stored on the fileserver that manages the sharing. A LAN cannot be all things to all people. It is important, therefore, to establish the purpose of a LAN prior to putting it in place. Will it be designated for use by a particular department or will it be designated as a writing lab for use by all students? Will it be shared by two or more departments? The target departments for Project SYNERGY are those which address the needs of underprepared college students. Among these departments, one can choose to let the LAN serve all of them or phase in one department at a time. The size of the student population in a department will influence the decision to a great extent. Even though the implementation can be done in a phased manner, however, one needs to think about anticipated growth.

In establishing the purpose of a LAN, it is wise to target specific needs of a selected segment of the student population, even at the cost of being criticized for showing favoritism toward a particular department, and focus on making that a successful experience. For too long, we have spread our resources too thin across too many areas and have been frustrated with the results. Therefore, we think it is more sensible to choose target areas, allocate sufficient resources, make this effort a success, and then move on to the next target area. Once the purpose of a LAN is clear, it becomes easier to determine what academic software (instructional as well as productivity tools) needs to be placed on the LAN. One cardinal principle to apply in the decision-making process here and in subsequent activities is to establish the purpose on the basis of **grassroots involvement.**

Physical Conditions

The use of a LAN is affected by several external physical conditions in the environment. The following highlights describe the more important conditions.

- Physical space must be arranged to accommodate the hardware, the furniture, and the individuals who will be using the facility. There needs to be space set aside for the LAN Manager, with a workstation and printer available. Ideally, this space should be in the same room as the LAN-room so it is easy for the Manager to work with students, but also set apart so that the

Manager's work does not disturb classes or students. There should be a separate room adjacent to the LAN-room that faculty can use for one-on-one conferences with students; four additional workstations should be connected to the network for faculty's use in this room. Finally, there should be a third room with tables where students can work together away from the computers. Instead of three separate rooms, there could be one large room with three distinct areas. Ideally, workstations for faculty should be in their offices and connected to the LAN. This goal can be achieved much more easily if the LANs are located next to the faculty offices in a department.

- Access to the LAN for students and faculty should be convenient and timely. As suggested above, is important to have some computers connected to the LAN placed in faculty offices to address their needs for convenience and timelines. For students' access, the location of the LAN, the adequacy of the number of workstations, and the number of available LAN hours (the time of the day and the number of hours) will address their needs for convenience and timeliness.

- Arrangement of workstations should consider various instructional modes such as classroom teaching, group studies, and independent study.

- The arrangement of a LAN should allow students enough space to work comfortably taking notes and using their books. Special consideration should be given to the needs of physically challenged students.

- Traffic patterns within the LAN-room should be considered in terms of entering and leaving the facility in general and with reference to physically challenged individuals in particular.

- Noise level should be controlled in relation to keyboards, printers, and multimedia software. Some of it can be controlled by the choice of hardware and some through efficient acoustics.

- Appropriate lighting and air conditioning definitely create a pleasant learning environment.

Social Conditions

The social conditions affecting a LAN are comprised of technical, educational, research, and management support, as well as communication and training. Integrating technology into the curriculum calls for some dramatic changes on the part of faculty and, therefore, they need support from a person who is empathetic with their role shift rather than a technological wizard who may have less appreciation for the teacher's role. For the readers' benefit, we have included job descriptions for a Software Implementation Designer and a Software Implementation Assistant.

The **Software Implementation Designer** is required to provide technical and educational support for faculty in designing effective strategies for integrating teaching, learning, and technology and for evaluating the outcomes. The Software Implementation Designer is expected to ensure that the LAN is providing a conducive teaching and learning environment to allow both faculty and students to concentrate on their tasks. This expectation requires minimizing network failures, technical impediments, and interruptions. This individual is expected to possess good interpersonal skills to work with faculty and help them in using the instructional software and evaluating the outcomes in a computer-networked environment. This individual will also be required to prepare reports and presentation materials about implementing and evaluating software and conducting workshops for faculty. A strong background in using technology for instruction and in working with networks (LAN's), operating systems, and electronic communication is preferred. Experience in teaching college students is highly desirable. A Master's degree in Educational Technology, Educational Psychology, or Educational Research is required.

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The Software Implementation Assistant is expected to work with faculty and students functioning at various technical skill levels and help them use the LAN efficiently and effectively. The individual is responsible for the operation, management, and supervision of the networked laboratory; for upgrading and maintaining fileserver operations, as well as installing, upgrading, and maintaining software; for maintaining the lab schedule, registering students in various courses, uploading and downloading data between mainframe and fileserver, and producing reports for faculty; for supporting faculty and students in the use of the software, trouble-shooting, and other related work to establish and maintain a conducive learning environment for students. The Software Implementation Assistant will be expected to handle security issues, manage sharing of the LAN's resources, and avoid violation of software-licensing agreements. A Bachelor's degree in Education or Computer Science or other equivalent field and three years of related experience are required. Interpersonal skills to work with faculty and students are essential.

Integrating technology with the teaching/learning environment involves a change in the role of faculty — to focus on learning more than they do on teaching, to think of individual students rather than a group of students, and to perceive themselves as facilitators of students' learning instead of givers of information. These changes can hardly be expected to take place overnight. Therefore, a gradual and systematic shift in their role as they combine technology with the human touch and establish a balance between the two to maximize student learning is essential.

Faculty development is an ongoing process that progresses in a spiral fashion as faculty develop a better understanding of their own strengths, their students' needs, and the potentials of technology to help them meet their students' needs. It involves acquiring skills in using productivity tools such as word processing, computerized slide presentations, spread sheets, and gradebooks, so that faculty can improve their own productivity levels; acquiring skills in exploring instructional software and finding ways to integrate it in teaching and learning with necessary changes in the curriculum and teaching methods; understanding the implications of shifting focus from teaching to learning as mentioned earlier and using technology to support this shift; understanding the importance of an internal frame of reference for integrating technology in the teaching/learning process in order to make the changes enduring and personally meaningful; understanding the role of tactics (knowing whom to contact, when to contact, how to get support, etc.) to help one's ideas to come to fruition; and understanding institutional policies and procedures with regard to use of technology on campus in order to avoid frustration and unnecessary labor.

Some faculty will require more support than others, and the support will embrace both technical and educational aspects. The Software Implementation Designer and Assistant should be able to accommodate whatever preferences and style a faculty member may bring. The concept of mentoring should be encouraged in each department to ensure that faculty who have been the early starters can help the new ones.

Since future investment in technology is questionable during times of financial crunch, we promote the need for accountability in a *Project SYNERGY Environment*. In order to be accountable, we must help faculty make research an integral part of the teaching and learning process. The Software Implementation Designer should assist the faculty in setting up their own research goals, defining a personally meaningful hypothesis, laying out the plan for integrating technology, implementing the plan, and evaluating the outcomes. It is important to help the faculty understand that research can be used as an instrument of change rather than as a litmus test of good or bad teaching. Formative evaluation is highly recommended in conducting an evaluation that allows room for faculty to refine their ways of integrating technology through replication of research across several terms.

Generally speaking, people tend to have great expectations for what technology can do and should do. Anything short of their expectations is blamed on the technology itself. Educators are no exception to this syndrome. Designing uses of software for instruction is neither simple nor small. It takes place within the context of an institutional environment and is influenced by a variety of factors, including how familiar faculty are with the software, how they design its uses, who the students are, and how the students respond to the software. Outcomes of research should, therefore, be studied carefully to identify the ways to improve future replications, rather than being used to judge the faculty or technology. Our presumption here is that the decision-makers have been careful in hiring the right kind of faculty and in selecting the right kind of technology, and, therefore, replications are necessary to determine the appropriate combination of human and technological support to help students succeed.

Administrative support plays a critical role in creating favorable conditions for a *Project SYNERGY Environment* to operate smoothly. It is imperative that the decisions affecting the operations of the LAN be made on the basis of grassroots involvement with a bottom-up approach. Procedures need to be established regarding personnel, budget, software acquisition, LAN scheduling, drawing a balance between scheduled classes and open labs for students, and adequate security provisions. There should also be procedures for receiving and welcoming visitors as the use of the LAN grows. Additionally, a process should be established for reviewing, acquiring, installing, and removing software, thus ensuring that the fileserver is not overloaded with software packages that take up much of the disk space. Our recommendation is to appoint a group of faculty to be in charge of periodic review of software for the LAN. Project SYNERGY Software Selector (PS^3) would be helpful in selecting new software (see page 39). It may also be possible to use the LAN facility to generate external revenue by conducting short-term courses or workshops for the community. It is recommended that such revenues be used for upgrading and maintaining the LAN. However, it is advisable to ensure that such external activities do not interfere with the regular operation of the LAN.

Communication plays an important role in making the *Project SYNERGY Environment* appealing to the faculty and students. As mentioned before, it is important to involve the end-users in the decision-making process about policies and procedures affecting the use of the LAN; open communication will ensure that problems are given immediate attention within this environment. A suggestion box should be available to solicit feedback from faculty and students on what could be improved in their teaching/learning situation. Each suggestion should be considered and an explanation provided as to what action has been taken. Another method of communication that would attract the involvement of faculty is discussing the research results in departmental meetings.

Cultural Conditions

The cultural conditions embrace the beliefs, customs, and traditions of a department and an institution, and they do have an impact on the efficacy of using a LAN and on the effectiveness of the outcomes. It is one thing to identify what the beliefs, customs, and traditions are; it is another to modify them when they are found to be detrimental to the effective use of a LAN. In many ways, we are at a crossroads in our effort to integrate technology into the curriculum, teaching, and learning. We can either take the road that leads to "business as usual" or take the other that leads to a *paradigm shift*. The latter, no doubt, is filled with uncertainties, emotionally loaded debates, agonies and ecstasies.

In this paradigm shift, educators must go beyond Mission Statements in their catalogs and exhibit a passion for accountability. They must be accountable in terms of reducing student dropout rates and increasing student success rates. They must orchestrate the use of human and technological resources to do the right things and do them well. They should not hesitate to question the traditional practices to determine whether or not they have a role in

this paradigm shift, and if they do, in what form. They should recognize that a substantial and enduring solution to a serious, nagging problem will require concerted and collaborative effort over an appreciable period of time. They should acknowledge that the solution is intertwined with technology, but embracing technology depends on the institution's priority, its willingness to put its resources into its priority, its awareness of its own political and social environment, and its belief in grassroots involvement. They should also acknowledge that devoting intensive and extensive attention to one targeted area such as the college-prep program for a stipulated time period is likely to yield greater results than dividing its resources among all its departments. In other words, tackling one department at a time is a wiser approach.

In embarking on this paradigm shift, we must make and take time to discuss and debate our traditional practices such as class size, number of contact hours, beginning and end of terms for courses, teaching focus vs. research orientation, and assessment tools and see how they fit into a *Project SYNERGY Environment*. No "sacred cows" are to be excluded from this debate. It is important to make time and take time for the debates because our cultural beliefs and traditions run very deep and shake the very roots of our educational systems.

We cannot ask for a better time to engage in these debates. First, there is less money to go around for education and greater demand for accountability. Second, technology is received well when it lessens the economic burden on an institution. Gone are those days when technology was received with open arms merely to raise the prestige of an institution. Technology can hardly prosper as an add-on expenditure. Third, national statistics show that the number of faculty nearing retirement is on the increase. Consequently, the timing is right for a paradigm shift in terms of recruiting new faculty (quantity and quality) and establishing the institutional expectations of them.

We appeal to our readers to travel the more difficult road in order to establish viable and valuable models for integrating technology, teaching, and learning. We will be more than happy to share your models with future Project SYNERGY readers.

Conclusion

Kamala Anandam
Project SYNERGY Director
Miami-Dade Community College

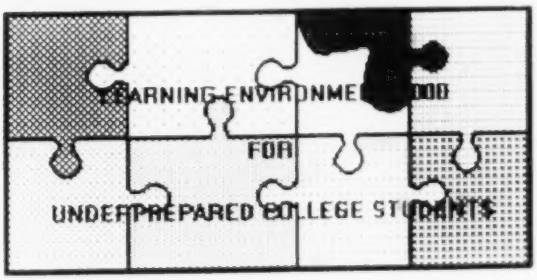
State of Technology in Education

Most individuals in education and in the hardware/software business will agree with me, I suspect, when I say that the state of technology in education is disappointing. Depending upon our level of investment in terms of time, effort, and funds, some of us might even say that it is dismal. When we consider, on the one hand, the investment in large, computer-based systems and, on the other, the isolated modules produced by individuals (mostly faculty), as well as everything in between, we realize that billions of dollars have been spent to revolutionize education with technology. The outcomes in the teaching/learning process are not anywhere close to our expectations.

Despite our disappointment with the state of technology in education, we will be quick to acknowledge, I am sure, the relentless effort of the **pioneers** in education who have brought us to where we are today. What we need now are the **settlers** who will establish the infrastructure in which the use of technology will become widespread. That is what Project SYNERGY is all about. As mentioned earlier, we began listening to the potential settlers, the faculty who teach the underprepared college students, and have designed PSI to meet their needs.

PSI is but a single piece, albeit an important one, in the jigsaw puzzle. When all the pieces are put together, we create the bigger picture of a *Learning Environment 2000 for Underprepared College Students*.

Our concept of the *Learning Environment 2000 for Underprepared College Students* is not quite complete; a piece is missing in the puzzle. The omission is intentional in order to allow each institution, department, and/or individual to identify a piece that will complete the picture and, thereby, personalize the *Learning Environment 2000 for Underprepared College Students* for individual circumstances.



Window of Opportunity

In undertaking to develop PSI and promote its adoption, we realize that we have to embark on a new direction. Call it a *paradigm shift*, if you will. Paradigm shifts share two essential characteristics. Their achievement is sufficiently unprecedented to attract an enduring group of adherents away from competing modes of activity, and simultaneously, they are sufficiently open-ended to leave all sorts of problems for the redefined group of practitioners to resolve. Project SYNERGY participants make up this "enduring group of adherents."

At the risk of being repetitive, in this paradigm shift, this group must go beyond Mission Statements in the catalogs and exhibit a passion for accountability. We must be accountable in terms of reducing student dropout rates and increasing student success rates. We must orchestrate the use of human and technological resources to do the right things and do them well. We should not hesitate to question the traditional practices to determine whether or not they have a role in this paradigm shift, and

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if they do, in what form. We should recognize that a substantial and enduring solution to a serious, nagging problem will require concerted and collaborative effort over an appreciable period of time. We should acknowledge that the solution is intertwined with technology, but embracing technology depends on the institution's priority, its willingness to put its resources into its priority, its awareness of its own political and social environment, and its belief in grassroots involvement. We should also acknowledge that devoting intensive and extensive attention to one targeted area such as the college-prep program for a stipulated time period is likely to yield greater results than dividing its resources among all its departments. In other words, tackling one department at a time is a wiser approach. Let us work together and show the way to be accountable.

What Next?

Miami-Dade is exploring ways to get funding for continuing the software review process and question writing beyond June 1994. Through the current Title III grant (October 1992 - September 1997), Miami-Dade will produce PSI, an intelligent, adaptive, and integrated management system for Local Area Networks (LAN's) with grassroots involvement of faculty at Miami-Dade and all other Project SYNERGY institutions. We are pleased that twelve publishers have agreed to port their software to Windows and make it communicate with PSI according to our specifications. The converted software will be known as the "starter set" and will be used along with PSI at Miami-Dade Community College and PSI training centers to be established across the country. In addition, we would like to establish 10 PSI pioneer colleges and 50 early adopter colleges, giving us a total of 66 institutions where PSI will become operational and provide support for other individuals. If you are interested in becoming one of the 66 institutions, please write to: Kamala Anandam, Miami-Dade Community College, 11011 SW 104 Street, Miami, Florida 33176.

While we provide a platform of neutrality for individuals and organizations (private and public) to develop quality instructional software and find a market for it through PSI more readily than at present, we wish to present "research" as the common thread that will link the PSI institutions to determine the usefulness of a PSI configuration in terms of educational and economic benefits. The collective wisdom emerging out of research studies conducted by various institutions will be widely disseminated.

Last but not least, we intend to publish a catalog of instructional software that is educationally sound as reviewed through project SYNERGY and is technically compatible with PSI as verified by the Division of Educational Technologies, M-DCC.

Name	College/University	Legend
Conlin, Mary Lou	Cuyahoga Community College	BW
Connelly, Bob	Santa Fe Community College	PL/QW/SW
Cooner-Berger, Linda	Miami-Dade Community College, Homestead Campus	FW
Cooper, Mary Jane	Delta College	SC
Cooper, Rayna	University of Tennessee at Martin	PL/SR
Cortes-Suarez, Georgina	Miami-Dade Community College, North Campus	FE/PB
Cossio, Matilde "Mattie"	Miami-Dade Community College, Medical Center	FW
Crawford, Joyce	Miami-Dade Community College, Wolfson Campus	BW/EC/FE*/FS/PB/SI/SID
Cuervo, Margarita	Miami-Dade Community College, Kendall Campus	FE/SU
Cueto, Marlene	Miami-Dade Community College, North Campus	DT/FE/FW
Culver, Lee	Miami-Dade Community College, Wolfson Campus	SU
Cunningham, John	Miami-Dade Community College, Kendall Campus	FE/PB/SU
Davis, Gary	Miami-Dade Community College, Wolfson Campus	BW
Davis, Lorna	Miami-Dade Community College, Kendall Campus	FE
Dearing, Carmen	Miami-Dade Community College, Wolfson Campus	PB/SU
DeChaine, Deborah	Miami-Dade Community College, Homestead Campus	FW
Dennis, Vivian	Dallas County Community College	BW/SM
Denton, Pegi	Johnson County Community College	BW
Despaigne, Jamaye Renee	Miami-Dade Community College, Wolfson Campus	FE/FW/SI
Dietrick, Carol E	Miami-Dade Community College, Homestead Campus	EC/FW/LS/SID
Dominguez, Nestor	Miami-Dade Community College, Kendall Campus	PB
Dorsey, Don	Foothill College	BW
Doucette, Don	League for Innovation	ST
Doughty, Irma	Miami-Dade Community College, North Campus	FE/PB
Dunne, Joe	St. Louis Community College	SW
Dyett, Adrian	Miami-Dade Community College, Wolfson Campus	FE (2)/LS/PB
Edward, Richard	Kirkwood Community College	BW/QR/SC/SR
Eisel, Ed	Miami-Dade Community College, District	PS
El Rayess, Suzanne	Monroe Community College	SE
Erickson, Michael	Monroe Community College	PL/QR/SR
Escudero, Katherine	Miami-Dade Community College, Kendall Campus	FE
Eskew, Thomas	University of Tennessee at Martin	PL
Evans, Christine	Miami-Dade Community College, Wolfson Campus	PB
Evseev, Anatoli	Cuyahoga Community College	SE
Ewell, Arcia	Miami-Dade Community College, Medical Center	PB
Fackrell, Jerry	Miami-Dade Community College, North Campus	FE/GP
Falcon, Maria	Miami-Dade Community College, Medical Center	PB
Fancher, Andrew	Miami-Dade Community College, Wolfson Campus	PB
Farben, Janie	Miami-Dade Community College, Kendall Campus	FE/FW
Faulkner, Ann	Mountain View College (Maricipa)	BW
Feldman, Philip	Bakersfield College (Kern)	BW
Fernandez, Tushnelda	Miami-Dade Community College, Medical Center	FW/QM
Ferrer, Marta	Miami-Dade Community College, Kendall Campus	FE/PB/SU
Fitton, Diane	Monroe Community College	SC

LEGEND

Software Review - SR-Reading, SW-Writing, SM-Math, SE-ESL, SC-Study Skills/Critical Thinking
Question Writing - QR-Reading, QW-Writing, QM-Math, QC-Coordinator

BW-Biltmore Workshop Prior to Project SYNERGY (2/89), DT-Design Team at M-DCC, EC-Evaluation Committee at M-DCC, FE-Faculty Exchange Visit at M-DCC (# in parentheses if more than 1), FS-Faculty Scenario, FW-Faculty Workshop at M-DCC, GP-Guides Pilot, LS-Lab Scenario, IC-Institutional Coordination, PB-Project Briefing at M-DCC, PC-Planning Committee (attended the planning meeting in Palisades, NY, March 1991), PL-Planning for Project SYNERGY Integrator (1991 Survey), PS-Project Staff, SI-Software Implementation, SID-Software Implementation Design, SS-Student Scenario, ST-Steering Committee, SU-Survey Response, 1992-93 (because some were anonymous, not all are named here)

* Organizer of a Faculty Exchange Visit

Name	College/University	Legend
Fitzgerald, Jeanne	Phoenix College (Maricopa)	PL/SM
Fletcher, Joyce	Northern Virginia Community College	BW
Flowers, Patricia Ford	Miami-Dade Community College, Wolfson Campus	PB
Frauman, Maxine	Lane Community College	SE
Gabert, Glen	Johnson County Community College	IC
Gabriel, Dennis	Cuyahoga Community College	PL/SR
Garces, Linda	Delta College	SE
Garcia, Isolde	Miami-Dade Community College, District	PS
Garcia, Judith	Miami-Dade Community College, Kendall Campus	PB
Garrett, Judy	Bakersfield College (Kern)	SE
Gerken, Donna	Miami-Dade Community College, Kendall Campus	FE/PB/QM/SU
Gil, Ariel	Miami-Dade Community College, Medical Center	SE
Gilkes, Lolita	Dallas County Community College	SID
Gist, Richard	Johnson County Community College	BW
Glenn, Azalee	Miami-Dade Community College, Kendall Campus	FE/FW
Glover, Polly	University of Tennessee at Martin	IC/PL/SID/ST
Goldstein, Adrienne	Miami-Dade Community College, Kendall Campus	FE
Golphin, Barbara	Miami-Dade Community College, Wolfson Campus	FE (2)/PB/SI
Gomez, Maria	Miami-Dade Community College, Medical Center	PB
Gonnet, Katherine	Dallas County Community College, District	BW/PC/SR
Gonzalez, Ileana	Miami-Dade Community College, Wolfson Campus	SU
Granros, Frederick	Miami-Dade Community College, Kendall Campus	FE
Graves, Felicia	Cuyahoga Community College West	SM
Green, Rosemary	Miami-Dade Community College, Wolfson Campus	PB
Griffin, Tom	Central Piedmont Community College	BW/IC/ST
Groomes, Marlene	Miami-Dade Community College, Homestead Campus	FW
Grussing, Dale	Miami-Dade Community College, North Campus	EC/FE (2) */PB
Guillermina, Damas	Miami-Dade Community College, North Campus	FE
Haasch, Jane	Fox Valley Technical College	BW
Haferling, Joy	Miami-Dade Community College, District	PS
Hahn, Lorraine	Miami-Dade Community College, Medical Center	PB
Hajdukiewicz, Bill	Miami-Dade Community College, North Campus	FE/FW/SI
Hanus-Zank, Catherine	Miami-Dade Community College, Wolfson Campus	FW/PB/SU
Harrell, Michelle R.	Miami-Dade Community College, Kendall Campus	FE (2)
Hauser, Paul	Kirkwood Community College	SC/SW
Haynes, Margot	Delta College	PL/SR
Heggen, Betty	Miami-Dade Community College, Kendall Campus	FE (2)/LS
Hernandez, Rosany	Miami-Dade Community College, Wolfson Campus	QM
Hernandez, Reynaldo	Miami-Dade Community College, Wolfson Campus	SU
Higley-Nugent, Heidi	Fox Valley Technical College	PL/SM
Hill-Matula, Janice	Moraine Valley Community College	SC/SR
Holloway, Alexandria	Miami-Dade Community College, Kendall Campus	PB
Holmgren, Libby	Johnson County Community College	SM
Humphrey, Ken L.	Monroe Community College	BW

LEGEND

Software Review: SR-Reading; SW-Writing; SM-Math; SE-ESL; SC-Study Skills/Critical Thinking
Question Writing: QR-Reading; QW-Writing; QM-Math; QC-Coordinator

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Name	College/University	Legend
Hungar, Julie	Seattle Community College	IC
Irvine, Kip	Miami-Dade Community College, Kendall Campus	FE
Jalloul, Janet T.	Miami-Dade Community College, Wolfson Campus	PB
Jenrette, Dave	Miami-Dade Community College, North Campus	BW/FE/GP
Jenrette, Mardee	Miami, Dade Community College, District	EC
Johnson, David	Miami-Dade Community College, Kendall Campus	FW/SU
Johnson, Jane	Bakersfield College (Kern)	SR
Jonason, Pat	Johnson County Community College	BW/PC/SR
Jones, Betty	Delta College	BW/IC
Jones, Jesse	Dallas County Community College, District	IC
Jones, Sharla	Miami-Dade Community College, Kendall Campus	FW
Jordan, Evelyn	Miami-Dade Community College, North Campus	FW
Joyce, Maria	Miami-Dade Community College, North Campus	PB
Jur, Barbara	Macomb Community College	IC
Kah, Susan	Miami-Dade Community College, Medical Center	PB
Kahn, Sue	Miami-Dade Community College, Kendall Campus	BW/FE/FW/SR
Kaiser, Virginia	Moraine Valley Community College	BW/QM/SM
Kaldor, Mike	Miami-Dade Community College, Wolfson Campus	FE*/PB
Kann, Annette	Miami-Dade Community College, Medical Center	FW/SU
Kann, Marlene	Miami-Dade Community College, Medical Center	FW
Kaplan, Gloria	Miami-Dade Community College, Medical Center	PB
Kaseberg, Alice	Lane Community College	SM
Kellogg, John	Miami-Dade Community College, North Campus	PB
Kirst, Joyce	Bakersfield College (Kern)	QR
Kline, Jan	Miami-Dade Community College, Medical Center	PB
Klosek, Stanley	Cuyahoga Community College	PL/SR
Kolman, Helen	Miami-Dade Community College, Kendall Campus	FE (2)
Kotler, Lorne	Miami-Dade Community College, District	PS
Krnacik, Mildred	Macomb Community College	SW
Lackey, Brenda	Universty of Tennessee at Martin	PC
Lake, Rich	St. Louis Community College	SR
Lamadriz, Rocio	Miami-Dade Community College, Wolfson Campus	SU
Lamazares, Ivonne	Miami-Dade Community College, North Campus	SI/SW
Lamb, Bill	Johnson County Community College	BW
Landsman, Mary	Santa Fe Community College	BW/PL
Lane, Linda	Foothill College	SR
Langan, Terry	Fox Valley Technical College	BW
Lawrence, Brad	Miami-Dade Community College, North Campus	PB
Leather, Carol	Miami-Dade Community College, Wolfson Campus	SU
Leitch, Patrick	Miami-Dade Community College, Medical Center	BW/FE/PL/SM
Leitman, Carolyn	Cuyahoga Community College	BW
Lescaille, Robert	Miami-Dade Community College, Kendall Campus	FE
Lester, John	Miami-Dade Community College, Wolfson Campus	SM
Lever, Judy	Miami-Dade Community College, Homestead Campus	FW/SID

LEGEND

Software Review: SR-Reading, SW-Writing, SM-Math, SE-ESL, SC-Study Skills/Critical Thinking
Question Writing: QR-Reading, QW-Writing, QM-Math, QC-Coordinator

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Name	College/University	Legend
Lewis, Sue	Miami-Dade Community College, Kendall Campus	FW
Lipof, Irene	Miami-Dade Community College, Wolfson Campus	PB/SID
Long, George	Miami-Dade Community College, Kendall Campus	FE/SU
Lore, Tricia	Humber College	BW
Lorenzo, Bert	Miami-Dade Community College, North Campus	PB
Lowery, Ben	Grambling State University	PC
Lucas, Steve	Phoenix College (Maricopa)	PL/SR
Ludeke, Jerry	Bakersfield College (Kern)	PL/SC/SR
Ludovici, Elaine	Miami-Dade Community College, North Campus	SI
Lugo, Leonor	Miami-Dade Community College, Medical Center	PB
Lukenbill, Jeffrey	Miami-Dade Community College, North Campus	IC/PB
MacLaughlin, Jackie	Central Piedmont Community College	PL/SM
Malena, Richard	Phoenix College (Maricopa)	PL/SR
Marin, H.	Miami-Dade Community College, North Campus	PB
Martelly, Diane	Miami-Dade Community College, Homestead Campus	FE*/FS/FW
Martin, Louise	Miami-Dade Community College, Medical Center	FE (2)/FW/SU
Martin, Wayne	Miami-Dade Community College, District	PS
Maspons, Maria	Miami-Dade Community College, Wolfson Campus	SU
Mass, Corey	Miami-Dade Community College, Wolfson Campus	SU
Matas, Adriana	Miami-Dade Community College, Wolfson Campus	EC
Mathews-Emerson, Sarae	Miami-Dade Community College, Kendall Campus	SM/SU
Mazzagatti, Roy	Miami-Dade Community College, Kendall Campus	FE
Mazzagatti, Cora	Miami-Dade Community College, Medical Center	PB
McCool, Samuel	Miami-Dade Community College, North Campus	FE (3)/GP/QW/SW/SU
McDaniel, Wendy	Miami-Dade Community College, District	PS
McDonald, Jean	Miami-Dade Community College, Homestead Campus	PB/FE*
McFadden, Nancy	Fox Valley Technical College	SR
McFared, John	Miami-Dade Community College, North Campus	PB
McKeever, Benjamin	Sinclair Community College	SW
McKitterick, Tom	Miami-Dade Community College, Kendall Campus	IC/PB
McLean, Ruth	Humber College	IC
McManus, Laurie	St. Louis Community College ar Meramec	BW
Meagher, Don	Miami-Dade Community College, North Campus	BW/FE (2)/QC/QR/SR/SU
Medina, Ira	Miami-Dade Community College, North Campus	BW/SE
Medina, Myra	Miami-Dade Community College, Medical Center	SE
Meistrell, Sonja	Miami-Dade Community College, Woflson Campus	SE
Mese, Jan	Miami-Dade Community College, Medical Center	PB/SR
Miller, Dwight	Lane Community College	PL/SM
Milmed, Joyce	Miami-Dade Community College, North Campus	FE
Mitchell, Cristi	Miami-Dade Community College, Kendall Campus	FW
Mohr, Ellen	Johnson County Communtiy College	PL/SW
Montiel, Yvonne	Gateway Community College (Maricopa)	BW
Moo, Andrew	Miami-Dade Community College, Kendall Campus	FE
Moran, Terry	Kirkwood Community College	IC

LEGEND

Software Review: SR-Reading, SW-Writing, SM-Math, SE-ESL, SC-Study Skills/Critical Thinking
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* Organizer of a Faculty Exchange Visit

Name	College/University	Legend
Morrell, Hector	Miami-Dade Community College, Homestead Campus	FW
Morrison, Chaplain	Miami-Dade Community College, Medical Center	FW
Moser, Don	St. Louis Community College	PL/SM
Muller, William	Moraine Valley Community College	QW/SW
Myers, Steven	Lane Community College	SM
Nation, Patricia	Miami-Dade Community College, Wolfson Campus	FW/PB/SU
Nelson, John	Lane Community College	SM
Nelson, Tanya	Miami-Dade Community College, Kendall Campus	FE/FW
Newmeister, Hillary	Bakersfield College (Kern)	QW
Nichols, Katrina	Delta College	PL/SM
Niles, Jennifer	Miami-Dade Community College, North Campus	FE (2)/FW/SU
Novatney, Janet	Miami-Dade Community College, Kendall Campus	FW
Nwankwo, Victor	Miami-Dade Community College, District	PS
O'Brien, Barbara	Miami-Dade Community College, District	PS
O'Connell, Theresa	Miami-Dade Community College, District	PS
O'Hara, Maureen	Miami-Dade Community College, Wolfson Campus	PB/SU
Ojeda, Maria	Miami-Dade Community College, District	PS
Orlin, Susan	Miami-Dade Community College, North Campus	FE/FW/SU/SW
Orr, Don	Miami-Dade Community College, North Campus	SI
Oseroff, Abe	Miami-Dade Community College, Kendall Campus	FE (2)/FW/PB
Page, Calvin E.	Miami-Dade Community College, Wolfson Campus	FE (3)
Paige, Christine	Grambline State University	SR
Paiva, Judy	Northern Virginia Community College	BW
Palazuelos, Mary	Miami-Dade Community College, North Campus	FE/FW/QM/SM
Palow, Bill	Miami-Dade Community College, Wolfson Campus	BW/FE*/FW
Paris, Mark	Miami-Dade Community College, North Campus	LS
Patterson, Bill	Foothill College	IC
Pattnaik, Suchitra	Miami-Dade Community College, District	PS
Payne, Michele	Kirkwood Community College	SW
Pelikant, Maryann	Miami-Dade Community College, North Campus	SU
Perez, Elena	Miami-Dade Community College, North Campus	FE/SI
Perez, Maritza	Miami-Dade Community College, North Campus	FE/GP
Perez, Janis	Miami-Dade Community College, Kendall Campus	SU
Perez, Guillermo	Miami-Dade Community College, Wolfson Campus	SU
Perez Capote, Juan	Miami-Dade Community College, North Campus	EC/PB
Perreira, Patricia	Miami-Dade Community College, Medical Center	PB
Pieke, Martin	Humber College	SC
Pierce, Tom	South Seattle Community College	SC
Pierrt, Frantz	Miami-Dade Community College, North Campus	PB
Piga, Susan	Miami-Dade Community College, Wolfson Campus	SU
Piziali, Gail	Miami-Dade Community College, North Campus	SID
Pollard, Betty	St. Louis Community College at Forest Park	BW
Pollard, Lonnie	Miami-Dade Community College, North Campus	FW
Pollock, Joanne	Fox Valley Technical College	BW

LEGEND:
Software Review: SR-Reading; SW-Writing; SM-Math; SE-ESL; SC-Study Skills/Critical Thinking
Question Writing: QR-Reading; QW-Writing; QM-Math; QC-Coordinator

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* Organizer of a Faculty Exchange Visit

Name	College/University	Legend
Pool, Rodger	Dallas County Community College District	IC/ST
Porter, David	Miami-Dade Community College, North Campus	SU
Portis, Theodore	Grambling State University	PL/SM
Prague, Melinda	Miami-Dade Community College, Wolfson Campus	PB/QC/QW
Press, Gail	Miami-Dade Community College, North Campus	FE/SC
Prignam, Judith	Miami-Dade Community College, North Campus	FW
Putz, Sandra	Foothill College	SM
Pyles, Carol	Miami-Dade Community College, Medical Center	PB
Quesada, Luis M.	Miami-Dade Community College, North Campus	PB
Radakovich, Dan	Jackons County Community College	ST
Raichoudary, Ram (Roy)	Miami-Dade Community College, Kendall Campus	FE/PB
Rakowsky, Christine	Cuyahoga Community College, West	SW
Rambo, Shirley	Miami-Dade Community College, North Campus	FW
Rann, Anette	Miami-Dade Community College, Medical Center	FW
Rappoport, Joel	Miami-Dade Community College, North Campus	FE/FS
Rasor, Leslie	Lane Community College	IC
Read, Garbriel	Miami-Dade Community College, North Campus	FW/GP/SI
Reed, Beatriz	Miami-Dade Community College, North Campus	FE/FW
Reeves, Mary	Miami-Dade Community College, Wolfson Campus	FW/SW
Riccio, Norma	Miami-Dade Community College, Wolfson Campus	SU
Richter, Suzanne	Miami-Dade Community College, Wolfson Campus	IC
Robertson, Sharon	University of Tennessee at Martin	SC
Rodriguez, Jesus	Miami-Dade Community College, District	PS
Rodriguez, Nimon	Miami-Dade Community College, Medical Center	BW
Roemer, Ann	Miami-Dade Community College, Wolfson Campus	SU
Rohr, Ted	St. Louis Community College	IC
Romeo, Jean	Delta College	QM
Rose, John	Miami-Dade Community College, Kendall Campus	PB
Rucker, John	Moraine Valley Community College	IC
Rymer, Tom	Lane Community College	SM
Sak, Deborak	Monroe Community College	PL/SW
Saleh, Abed	Miami-Dade Community College, Wolfson Campus	FW
Samet, Scott	Miami-Dade Community College, District	PS
Samms, Evlette	Miami-Dade Community College, North Campus	PB
Sanderson, Sara Lee	Miami-Dade Community College, Kendall Campus	DT/EC/FE (3)*/PB/SC
Sastre, Margarita	Miami-Dade Community College, North Campus	FE (2)/FW/SU
Schinoff, Richard	Miami-Dade Community College, Homestead Campus	FW/IC
Schmelzer, Judy	Miami-Dade Community College, Kendall Campus	FW
Schomer, Steven	Miami-Dade Community College, Medical Center	FW
Schuemann, Cynthia	Miami-Dade Community College, Wolfson Campus	FS/SC/SU
Schurger, Judith	Miami-Dade Community College, Homestead Campus	FW
Schwartz, Pearl	Miami-Dade Community College, Kendall Campus	FE
Scott, David	Kern Community College, District	BW/IC/ST
Segall, Michaela	Miami-Dade Community College, North Campus	FE*/FW/PB/SU

LEGEND:
Software Review: SR-Reading; SW-Writing; SM-Math; SE-ESL; SC-Study Skills/Critical Thinking
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Name	College/University	Legend
Senfeld, Leonore	Miami-Dade Community College, North Campus	FE (2)
Sharpten, Robert	Miami-Dade Community College, Kendall Campus	FE/SU
Shin, Alfred	Humber College	PL/SM
Shumaker, Paul	Cuyahoga Community College	IC
Sileika, Antanas	Humber College	SE
Siu, Giselle	Miami-Dade Community College, Wolfson Campus	FW/SID
Smith, Lois V.	Miami-Dade Community College, North Campus	PB
Smith, Melvin	Miami-Dade Community College, North Campus	FE (3)/FW/GP
Smittle, Pat	Santa Fe Community College	IC
Sodon, James R.	St. Louis Community College at Florissant	BW
Spano, Carleen	Miami-Dade Community College, Medical Center	EC/IC
Spence, Leighton	Miami-Dade Community College, Homestead Campus	FE
Speranza, Angela	Miami-Dade Community College, Homestead Campus	FW
Stackelberg, Cora	Cuyahoga Community College	PL/SM
Stanley, Dorothy	Bakersfield College (Kern)	PC/SM
Stearns, Martha	Central Piedmont Community College	PC/SR
Steer, Helena	Miami-Dade Community College, Wolfson Campus	FW
Stevens-Garcia, Maria	Miami-Dade Community College, Wolfson Campus	FE/PB
Stoyanovich, Dragolyub	Miami-Dade Community College, Kendall Campus	FE
Sturm, Bruce	DeAnza College	BW
Suco, Elizabeth	Miami-Dade Community College, Wolfson Campus	FE (2)/LS
Sunico, Sharon	DeAnza College	QW
Susini, Sheila	Humber College	BW
Sussman, Marjorie	Miami-Dade Community College, Wolfson Campus	FE/FW/SI/SR/SU
Sussman, Barbara	Miami-Dade Community College, Medical Center	FE (2)/FS/FW/SC/SU
Swan, Greg	Maricopa Community College District	IC
Symons, Jim	DeAnza College	BW/QM/SM
Taghi-Zoghi, Karen	Miami-Dade Community College, North Campus	LS/SU
Tagle, Tessa Martinez	Miami-Dade Community College, Medical Center	PB
Talavera, Ernest	Miami-Dade Community College, Wolfson Campus	FE/SI
Tarber, Judity	Miami-Dade Community College, Wolfson Campus	FW
Tebbs, Don	Miami-Dade Community College, Kendall Campus	BW/SU
Tennant, Jeff	Santa Fe Community College	PL/SM
Thomas, Jean	Foothill College	BW
Thomas, Linda	Miami-Dade Community College, District	PS
Thomas, Sharon	Miami-Dade Community College, Kendall Campus	FW
Thompson, Robert	Lane Community College	SM
Tillett, Bill	Miami-Dade Community College, North Campus	QW/SI/SU/SW
Tixier, Linda	Miami-Dade Community College, North Campus	PB/SI
Torrella, Rafael	Miami-Dade Community College, Wolfson Campus	PB
Tucker, Walter	Miami-Dade Community College, North Campus	FE
Tulloch, Denton	Miami-Dade Community College, North Campus	FW
Veiga, Marisella L.	Miami-Dade Community College, Homestead Campus	FW
Velilla, Angie	Miami-Dade Community College, Kendall Campus	SE

LEGEND

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Name	College/University	Legend
Verdieu, Lucas	Miami-Dade Community College, Wolfson Campus	FW
Verrett, Joyce	Grambling State University	IC
Vicente, Jose	Miami-Dade Community College, Wolfson Campus	EC
Vicenti, William	Kean College Of New Jersey	IC
Villamil, John	Miami-Dade Community College, Wolfson Campus	PB/SID
Villar, Maria C.	Miami-Dade Community College, Wolfson Campus	PB
Walker, Daisy	Miami-Dade Community College, North Campus	SI
Walters, Jim	Phoenix College (Maricopa)	IC
Walton, Donna	Miami-Dade Community College, Medical Center	FE/FW/SW
Walucoms, Carl	Seattle Central Community College	PL/SR/SW
Wambu, Judy	Kean College of New Jersey	PL/SR
Warford, Lawrence	Lane Community College	IC
Warmke-Robitaille, Julie	Santa Fe Community College	SE
Warren, Lucille	Sinclair Community College	IC
Weaver, Chris	Miami-Dade Community College, Medical Center	LS/SID
Webb-Petschauer, Joni	Appalachian State University	SC
Weglarz, John	Kirkwood Community College	PL/SM
Welch, George	Miami-Dade Community College, Kendall Campus	BW/EC/FE/PB/PL/SW
Welch, Reina K.	Miami-Dade Community College, Wolfson Campus	DT/FW/SE
West, Carolyn	Macomb Community College	SM
Whalen, Wick	Miami-Dade Community College, Kendall Campus	FW (2)
Whearty, James	Foothill College	PL/SW
Whetstone, Jr., Mike	Miami-Dade Community College, North Campus	FE
Whiteneck, Alice	Lane Community College	SC
Whiteside, Don	Miami-Dade Community College, Kendall Campus	FW
Widmer, Diane	Miami-Dade Community College, Wolfson Campus	SU
Wiley, Bennie	Miami-Dade Community College, Kendall Campus	PB/FE
Williams, Claude	Central Piedmont Community College	IC
Williams, Roger	Cuyahoga Community College	IC
Willig, Barbara	Miami-Dade Community College, Medical Center	BW/FE/FW/SU
Willoughby, Lois	Miami-Dade Community College, Kendall Campus	FW
Winebrenner, Larry	Miami-Dade Community College, Medical Center	SW
Winter, Deobrah	Miami-Dade Community College, Medical Center	BW/FE (2)/FW
Wirtel, Joseph	Miami-Dade Community College, North Campus	PB
Wolven, Fred	Miami-Dade Community College, Homestead Campus	FE/QR/QW/SR/SW
Wong, Linda	Lane Community College	BW
Wright, Jenna	University of Tennessee at Martin	PL/SE/SW
Wyers, Lori	Fox Valley Technical College	IC
Yoder, Jonathan	Northern Virginia Community College	BW
Young, Eleanor	Sinclair Community College	IC
Young, Nancy Wilson	Miami-Dade Community College, Kendall Campus	FE (2)
Zabsky, Harold	Miami-Dade Community College, Medical Center	PB
Zaldivar, Raquel	Miami-Dade Community College, Wolfson Campus	SI

LEGEND:
Software Review: SR-Reading; SW-Writing; SM-Math; SE-ESL; SC-Study Skills/Critical Thinking
Question Writing: QR-Reading; QW-Writing; QM-Math; QC-Coordinator

BW-Biltmore Workshop Prior to Project SYNERGY (2/89); DT-Design Team at M-DCC; EC-Evaluation Committee at M-DCC; FE-Faculty Exchange Visit at M-DCC (# in parentheses if more than 1); FS-Faculty Scenario; FW-Faculty Workshop at M-DCC; GP-Guides Pilot; LS-Lab Scenario; IC-Institutional Coordination; PB-Project Briefing at M-DCC; PC-Planning Committee (attended the planning meeting in Palisades, NY, March 1991); PL-Planning for Project SYNERGY Integrator (1991 Survey); PS-Project Staff; SI-Software Implementation; SII-Software Implementation Design; SS-Student Scenario; ST-Steering Committee; SU-Survey Response: 1992-93 (because some were anonymous, not all are named here).

* Organizer of a Faculty Exchange Visit

Appendix B

Software Attributes

Software Content Attributes:

Accuracy (3)
Information is current
There are no factual errors
Content is free of spelling & grammatical errors

Appropriateness (5)
Models and examples are not oversimplified
Content is free of stereotypes & social biases
It includes problem-solving situations of varying difficulty
It provides applications to real-life situations
It is not obscured by jargon or technical terms

Feedback (3)
Content provides explanation of correct answers
It provides alternate explanations
Alternate explanations aim to correct student understanding

Meeting Faculty Needs:

Ease of Implementation (6)
Documentation is provided
It presents ways the package can be used
It provides support materials
It describes how to assess student performance
Software requires minimal teacher time to get students using it
It frees up teacher time from tedious tasks

Adaptability (6)
Software gives individual attention to students as needed
It can be customized for a group of students
It can be customized for a single student
It can be used for independent study
It can be used for peer groups
It can be used for classroom presentations

Summary Information (6)
Software maintains student usage and performance records
It generates summary reports that can be viewed on screen
It generates summary reports that can be printed
It generates summary reports as an ASCII text file
Student data are stored on each student disk
Student data are stored on disk for a class of students

Meeting Student Needs:

Ease of Use (7)
On-line directions are clear, concise, and complete
On-line help is clear, concise, and complete
Student manuals are provided
They are helpful
Student workbooks are provided
They are useful
Software provides status messages to minimize confusion

Adaptability (4)
Software adjusts content based on student responses
It allows branching into different parts of the program
It adapts to the first-time versus the experienced user
It adapts to a range of reading abilities

Testing (3)
Software incorporates pre-tests
It incorporates post-tests
It allows students to leave a question unanswered & go back to it later

Tracking (2)
Software keeps students informed of progress
It provides a summary of performance & suggests what to do next

Interactivity (7)
Software actively engages the student
It provides student feedback
It is tied to the responses and thus is credible and supportive
It explains errors
It suggests corrections of errors
It forgives extraneous errors
It presents relevant practice exercises

Appropriateness (18)
Software allows students to think and solve problems
Examples are appropriate for adult learners
Animation and/or graphics are used
They focus attention on important content and process
They allow coverage of advanced concepts
They are appropriate for adult learners
Sound-effects are used
They focus attention on important content and process
They allow coverage of advanced concepts
They are appropriate for adult learners
Color is used
It focuses attention on important content and process
It allows coverage of advanced concepts
It is appropriate for adult learners
Video is used
It focuses attention on important content and process
It allows coverage of advanced concepts
It is appropriate for adult learners

Software Operations:

Reliability (3)
Software is free of programming errors
It runs with minimum delays
Extraneous input does not disrupt the program

Format (7)
Program maintains a bookmark for reentry
Program allows the student to magnify print
Voice capability is used
The right quantity is presented
It is audible
Inappropriate dialect is avoided
Screens are free of clutter and dense print

Reading Objectives

Word Learning Skills (46)

Word Recognition

Phoneme-grapheme relationships (phonics):

- Vowels — W, S
- Consonants — W, S
- Vowel and consonant combinations — W, S
- Syllabification — W, S
- Emphasis (stress) — W, S
- Compound words — W, S

Basic sight words:

- Word configurations — W, S
- Typical recognition lists (Dolch, Thorndike, et. al.) — W, S

Dictionary Skills

- Order of entries (alphabetizing)
- Guide words
- Parts of word entries
- Diacritical markings
- Selecting an appropriate definition for a word in context
- Using dictionaries with different organizational patterns
- Using the dictionary as a source of information

Context Clues for Word Meanings

- Direct definition or restatement clues — S, P, G
- Punctuation / typographical clues — S, P, G
- Experience clues (reader's knowledge base) — S, P, G
- Example clues — S, P, G
- Summary clues — S, P, G
- Comparison / contrast clues — S, P, G

Word Elements to Define Words

- Prefixes in words — W, S, P, G
- Suffixes in words — W, S, P, G
- Roots in words — W, S, P, G
- Combinations of prefixes, suffixes, & roots — W, S, P, G

New Words in Specialized Groupings

- Occupational / technical words — W, S, P, G
- Academic words from core areas — W, S, P, G
- Words with multiple meanings — W, S, P, G
- Words with similar sounds but different spellings & meanings — W, S, P, G

Correct Spelling

- Applying phoneme / grapheme relationships — W, S
- Applying knowledge of word parts — W, S
- Applying basic spelling rules — W, S
- Developing a personalized system for spelling improvement — W, S

Word Relationships

- Antonyms — W, S, P
- Synonyms — W, S, P
- Homonyms — W, S, P
- Part to whole / whole to part — W, S, P
- Function — W, S, P
- Rhyme — W, S, P
- Attributes (characteristics) — W, S, P
- Spelling — W, S, P
- Member to class / class to member — W, S, P
- Age or size — W, S, P
- Cause / effect — W, S, P
- Creating simple analogies to show relationships — W, S, P
- Solving analogies — W, S, P

W = Word Level S = Sentence Level

Functional Reading (10)

- Understanding signs (enter, exit, smoking in designated areas only, etc.)
- Understanding forms (college registration, etc.)
- Understanding simple instructions (in textbooks, tests, etc.)
- Understanding information found in newspapers
- Understanding information found in restaurant menus
- Understanding information found in telephone directories
- Understanding information found on food labels
- Understanding information found on medicine labels
- Understanding information found in public transportation schedules
- Understanding information found in training manuals

Basic Comprehension (15)

Topic/Main Idea

- Recognizing the stated main idea of a paragraph / passage — P, G
- Recognizing the unstated main idea of a paragraph / passage — P, G
- Formulating the main idea of a paragraph (topic sentence) or of a longer passage (thesis) — P, G

Details

- Identifying the major details of a paragraph / passage — P, G
- Identifying the minor details of a paragraph / passage — P, G

Organizational Patterns

- Sequence — P, G
- Cause / effect — P, G
- Comparison / contrast — P, G
- Definition — P, G
- Example — P, G
- Facts — P, G
- Enumeration — P, G
- Classification — P, G
- Problem / solution — P, G
- Mixed patterns — P, G

Transitional Expressions (9)

- Sequence — S, P, G
- Cause / effect — S, P, G
- Comparison / contrast — S, P, G
- Definition — S, P, G
- Example — S, P, G
- Summary — S, P, G
- Enumeration — S, P, G
- Problem / solution — S, P, G
- Mixed patterns — S, P, G

Critical Comprehension (29)

Author's Purpose

- Writing to inform or explain — S, P, G
- Writing to persuade — S, P, G
- Writing to elicit emotion or mood — S, P, G
- Writing to entertain — S, P, G

Author's Bias

- Bias by proportion (emphasis) — S, P, G
- Bias by a choice of information — S, P, G
- Bias by a word choice's denotation — S, P, G

P = Paragraph Level G = Passage Level

- Bias by a word choice's connotation — S, P, G
- Euphemisms — S, P, G
- Stereotyping — S, P, G
- Propaganda techniques — S, P, G

Author's Tone

- Irony — S, P, G
- Cynicism — S, P, G
- Wit and humor — S, P, G
- Sarcasm — S, P, G
- Satire — S, P, G

Making Judgments

- Differentiating fact and opinion — S, P, G
- Drawing conclusions — S, P, G
- Making inferences — S, P, G
- Considering the author's qualifications — S, P, G
- Considering other viewpoints not expressed by the author — S, P, G
- Examining quantity and quality of evidence — S, P, G
- Challenging assumptions or analogous relationships — S, P, G

Author's Use of Figurative Language

- Simile — S, P, G
- Metaphor — S, P, G
- Allusion — S, P, G
- Personification — S, P, G
- Hyperbole and understatement — S, P, G
- Idiomatic expressions — S, P, G

Textbook/Technical Reading (18)

Reading to Study

- Relating text passages to visual / graphic materials — S, P, G
- Textbook previewing techniques — S, P, G
- Note-taking — S, P, G
- Outlining — S, P, G
- Mapping — S, P, G
- Summarizing / synthesizing — S, P, G
- Reading-to-study techniques (e.g., SQ3R) — S, P, G
- Locating specific information — S, P, G

Interpreting visual materials

- Charts — S, P, G
- Graphs — S, P, G
- Maps — S, P, G
- Tables — S, P, G
- Diagrams / illustrations — S, P, G

Reading for Tests

- Multiple-choice questions
- True / false questions
- Matching questions
- Completion questions
- Understanding key words in essay questions

Reading in Content Areas (29)

Mathematics

- Surveying the textbook — S, P, G
- Applying a reading-to-study technique — S, P, G
- Applying vocabulary / memory techniques to learn symbols and formulas — S, P, G
- Applying steps in analyzing mathematical word problems — S, P, G
- Applying skills for reading visual materials — S, P, G

Social Sciences

- Surveying the textbook — S, P, G
- Applying a reading-to-study technique — S, P, G
- Applying vocabulary / memory techniques to understand concepts & terminology — S, P, G
- Recognizing frequently used organizational patterns — S, P, G
- Applying critical comprehension skills — S, P, G
- Applying skills for reading visual materials — S, P, G

Sciences

- Surveying the textbook — S, P, G
- Applying a reading-to-study technique — S, P, G
- Applying vocabulary / memory techniques to understand symbols, formulas, concepts, and terminology — S, P, G
- Recognizing frequently used organizational patterns — S, P, G
- Applying critical comprehension skills — S, P, G
- Applying skills for reading visual materials — S, P, G

Humanities and Literature

- Surveying the textbook — S, P, G
- Applying a reading-to-study technique — S, P, G
- Applying vocabulary / memory techniques to understand concepts & terminology — S, P, G
- Recognizing frequently used organizational patterns — S, P, G
- Applying critical comprehension skills — S, P, G
- Applying skills for reading visual materials — S, P, G

Vocational/Occupational/Technical Studies

- Surveying the textbook — S, P, G
- Applying a reading-to-study technique — S, P, G
- Applying vocabulary / memory techniques to understand concepts & terminology — S, P, G
- Recognizing frequently used organizational patterns — S, P, G
- Applying critical comprehension skills — S, P, G
- Applying skills for reading visual materials — S, P, G

Rate & Flexibility (11)

Building reading rate

- Reading phrases rather than individual words — P, G
- Skimming techniques — P, G
- Scanning techniques — P, G
- Flexible reading rates — P, G
- Techniques to overcome barriers to flex. reading — P, G

Establishing a purpose for reading

Using flexible reading rates:

- Skimming techniques — P, G
- Scanning techniques — P, G

Making decisions according to purpose:

- Choosing texts according to information need — P, G
- Choosing texts according to readability level — P, G
- Choosing texts according to level of detail / generality — P, G
- Choosing texts according to author viewpoint / bias — P, G

W = Word Level S = Sentence Level P = Paragraph Level G = Passage Level

Writing Objectives

Prewiting (12)

Building Fluency
- Free writing
- Keeping a journal
- Blind writing

Generating/Organizing Information (Ideas)
- Brainstorming
- Clustering and mapping
- Questioning (using lists of questions)
- Engaging in situational writing (case studies)
- Examining developmental models (e.g., definition)
- Responding to readings
- Interviewing
- Reasoning inductively/deductively
- Using sources (appropriate databases)

Writing (25)

Limiting the Thesis
- Sentence completion
- Modeling (illustrations, examples)
- Open-ended options (illustrations used as idea starters)

Organizing/Outlining Information (Ideas)
- Experimentation with original formats/ possibilities (e.g., rhetorical modes) P, E
- Forms and graphic structures to be filled in (e.g., comparison/contrast, process, etc.) P, E
- Classifying P, E
- Establishing priorities P, E
- Clustering and mapping P, E

Composing a Draft

Using rhetorical modes:
- Description P, E
- Narration P, E
- Illustration P, E
- Comparison/contrast P, E
- Cause/effect P, E
- Definition P, E
- Process analysis P, E
- Argument P, E
- Drafting topic sentences
- Drafting thesis statements
- Clarifying main points with supporting details P, E

Achieving Unity and Coherence
- Transitions S, P, E
- Key words (repetitions, echoes) S, P, E
- Synonyms S, P, E
- Antonyms S, P, E
- Subordination S, P, E
- Coordination S, P, E

Revision (12)

Reassessing Expectations
- Audience
- Purpose
- Tone

Evaluating the Draft

Thesis:
- Unity
- Focus

Organization:
- Coherence
- Paragraphs
- Evidence/illustration/details

Sentences:
- Syntax
- Variety
- Combining
- Diction

Editing (25)

Proofreading
- Paragraphing (indenting or blocking)
- Capital letters
- Abbreviations
- Hyphenation
- End punctuation
- Internal punctuation
- Special graphics
- Apostrophes
- Spell-checking

Improving Word, Phrase, and Clause Usage
- Nouns: singular/plural; possessive forms
- Pronouns: singular/plural; possessive forms; subjective/objective case
- Verbs: mood; voice; tenses; infinitives; participles; gerunds
- Conjunctions
- Adjectives
- Articles (definite/indefinite)
- Adverbs
- Prepositions
- Spelling
- Phrases
- Dependent clauses
- Independent clauses

Improving Word Relationships
- Subject-verb agreement
- Noun-pronoun agreement
- Sequence of tenses
- Modification

S = Sentence Level P = Paragraph Level E = Essay Level

Mathematics Objectives

Base Ten Notation (8)

Reading whole numbers and writing in standard notation from zero to one trillion
Writing as a standard numeral a number named by a verbal expression
Rounding a given number to the nearest ten, hundred, or thousand
Using whole number exponents in power notation to represent products
Using whole number products to represent powers with whole number exponents
Writing standard numerals from expanded numerals
Writing expanded numerals from standard numerals
Comparing and ordering whole numbers

Basic Ops/Whole Numbers(10)

Recognizing counting or natural numbers
Recognizing whole numbers
Performing the operation of addition on the set of whole numbers
Performing the operation of subtraction on the set of whole numbers
Performing the operation of multiplication on the set of whole numbers
Performing the operation of division on the set of whole numbers
Estimating sums, differences, products, and quotients of whole numbers
Recognizing number properties
Applying rules for order of operations
Finding square roots of perfect square numbers

Prime Numbers & Factorization (4)

Determining the factors of a given number of reasonable magnitude
Determining prime factorization of numbers of reasonable magnitude
Identifying any prime number less than one hundred
Determining the least common multiple using prime factorization of two or more numbers of reasonable magnitude

Basic Ops/Positive Fractions (19)

Constructing models to represent fractions
Writing equivalent fractions
Simplifying fractions
Comparing fractions
Performing the operation of addition on the set of rational numbers using fractional numerals
Performing the operation of subtraction on the set of rational numbers using fractional numerals
Performing the operation of multiplication on the set of rational numbers using fractional numerals
Performing the operation of division on the set of rational numbers using fractional numerals
Converting mixed numerals to improper fractional numerals
Converting improper fractional numerals to mixed numerals
Performing the operation of addition on the set of rational numbers using mixed numerals
Performing the operation of subtraction on the set of rational numbers using mixed numerals
Performing the operation of multiplication on the set of rational numbers using mixed numerals
Performing the operation of division on the set of rational numbers using mixed numerals
Simplifying complex fractions
Estimating sums, differences, products, and quotients of mixed numbers
Raising fractions to positive integer powers
Finding square roots of perfect square fractions
Applying order of operations rules for fractional numerals

Basic Ops/ Positive Decimals (13)

Constructing models to represent decimal numerals
Comparing magnitude of decimal numbers
Rounding decimal numbers to an indicated place
Expressing a fractional or mixed numeral as a decimal numeral
Expressing a decimal numeral as a fractional or mixed numeral
Performing the operation of addition on the set of rational numbers using decimal numerals
Performing the operation of subtraction on the set of rational numbers using decimal numerals
Performing the operation of multiplication on the set of rational numbers using decimal numerals
Performing the operation of division on the set of rational numbers using decimal numerals
Simplifying complex fractions involving decimals
Combining rational numbers in different notations
Estimating sums, differences, products, and quotients of decimal numbers
Applying order of operations rules

Ratio and Proportions (6)

Constructing models of ratios
Writing ratios
Identifying a proportion
Solving a proportion
Identifying and writing rates including unit rates
Solving word problems using proportion

Percents (7)

Constructing models to represent percent
Expressing percent numerals as decimal numerals
Expressing decimal numerals as percent numerals
Expressing percent numerals as fractional numerals
Expressing fractional numerals as percent numerals
Solving simple percent problems
Expressing statements and questions contained in problems involving percents as number sentences of proportions and then solving the problems

Units of Measure (10)

Recognizing appropriate units of length, weight, and capacity in English System
Converting within English units of length, weight, and capacity
Recognizing appropriate units of length, mass, and capacity in metric system
Converting within metric units of length, mass, and capacity
Converting from English units of length, weight, and capacity to metric units of length, mass, and capacity and vice versa
Simplifying denominate numbers (e.g., 6 ft. 5 in.)
Performing the operation of addition on denominate numbers (i.e., numbers representing units of measure)

Performing the operation of subtraction on denominate numbers, i.e., numbers representing units of measure
Performing the operation of multiplying a denominate number, i.e., a number representing a unit of measure, by a rational number
Performing the operation of dividing a denominate number, i.e., a number representing a unit of measure, by a rational number

Basic Geometry (41)

Recognizing parallel lines and their properties
Recognizing perpendicular lines and their properties
Recognizing angles and their properties
Recognizing squares and their properties
Recognizing rectangles and their properties
Recognizing parallelograms and their properties
Recognizing rhombuses and their properties
Recognizing trapezoids and their properties
Recognizing other quadrilaterals and their properties
Recognizing triangles and their properties
Recognizing right triangles and their properties
Recognizing circles and their properties
Constructing models for perimeter to derive a formula for rectangles
Constructing models for perimeter to derive a formula for squares
Constructing models for perimeter to derive a formula for triangles
Constructing models for perimeter to derive a formula for circles
Constructing models for area to derive a formula for rectangles
Constructing models for area to derive a formula for squares
Constructing models for area to derive a formula for triangles
Constructing models for area to derive a formula for trapezoids
Constructing models for area to derive a formula for rhombuses
Constructing models for area to derive a formula for parallelograms
Constructing models for area to derive a formula for circles
Distinguishing between perimeter and area
Computing perimeter of rectangles
Computing perimeter of squares
Computing perimeter of triangles
Computing perimeter of trapezoids
Computing perimeter of parallelograms
Computing perimeter of rhombuses
Computing circumference of circles
Computing area of rectangles
Computing area of squares
Computing area of triangles
Computing area of trapezoids
Computing area of parallelograms
Computing area of rhombuses
Computing volume of geometric figures
Solving applied problems involving perimeter
Solving applied problems involving area
Solving applied problems involving volume

Basic Ops/Signed Numbers (10)

Recognizing integers
Recognizing rational numbers
Constructing model signed numbers
Finding the absolute value of rational numbers
Performing the operation of addition on the set of rational numbers, including negative rational numbers
Performing the operation of subtraction on the set of rational numbers, including negative rational numbers
Performing the operation of multiplication on the set of rational numbers, including negative rational numbers
Performing the operation of division on the set of rational numbers, including negative rational numbers
Evaluating exponential expressions of signed numbers
Applying rules for order of operations on rational numbers

Real Numbers (25)

Reviewing basic arithmetic with positive real numbers: powers, roots
Reviewing order of operations with positive real numbers
Recognizing natural numbers
Recognizing whole numbers
Recognizing integers
Recognizing rational numbers
Recognizing irrational numbers
Recognizing the symbols < and > with real numbers
Recognizing absolute value of a real number
Identifying number line
Performing arithmetic with signed numbers
Using number line for definition of signed number arithmetic
Using rules for definition of signed number arithmetic
Presenting integer exponents of real numbers
Presenting positive roots of real numbers
Evaluating expressions involving several operations
Evaluating expressions involving grouping symbols
Evaluating expressions involving exponents
Recognizing commutative property
Recognizing associative property
Recognizing distributive property
Recognizing additive identity
Recognizing additive inverse
Recognizing multiplicative identity
Recognizing multiplicative inverse

Set Notation (7)

Recognizing set notation symbol for union
Recognizing set notation symbol for intersection
Recognizing set notation symbol for complement
Finding the union of at least two sets
Finding the intersection of at least two sets
Finding the complement of a set
Drawing Venn Diagrams

Simple Linear Eq./One Variable (7)

Recognizing variables, expressions, and equations
Solving linear equations by addition - subtraction principle of equality
Solving linear equations by multiplication - division principle of equality
Solving linear equations - multi-step
Solving proportions
Solving word problems
Solving absolute value equations

Simple Linear Ineq./One Variable (6)

Recognizing inequalities
Solving inequalities

Recognizing absolute value inequalities
Solving absolute value inequalities
Graphing solutions of inequalities on a number line
Solving word problems

Integer Exponents (9)

Recognizing an integer exponent and variable base
Performing multiplication with integer exponents
Performing division with integer exponents
Simplifying expressions containing negative integer exponents
Performing powers with integer exponents
Recognizing scientific notation
Converting to scientific notation
Converting from scientific notation
Performing arithmetic operations with scientific notation

Polynomials (18)

Recognizing constants, variables, terms, and coefficients
Recognizing a monomial
Recognizing a binomial
Recognizing a trinomial
Recognizing a polynomial
Recognizing the degree of a polynomial
Recognizing the correct order to write a polynomial
Recognizing rules for exponents
Simplifying expressions containing grouping symbols
Evaluating algebraic expressions
Performing multiplication by a monomial
Performing multiplication by a binomial
Performing multiplication by a trinomial
Performing multiplication by a polynomial with more than three terms
Recognizing special product forms
Dividing a polynomial by a monomial
Dividing a polynomial by a binomial
Dividing a polynomial by a polynomial of more than two terms

Factoring (6)

Recognizing factors
Factoring by greatest common factor
Factoring the difference of squares
Factoring trinomials
Factoring the sum and difference of two cubes
Recognizing a perfect square trinomial

Graphs (21)

Recognizing a number line graph
Recognizing the Cartesian coordinate system
Recognizing quadrants
Recognizing ordered pairs
Recognizing ordered pairs by quadrant
Plotting ordered pairs
Recognizing linear equations with two variables
Finding solutions to linear equations with two variables
Graphing a linear equation using a table of values
Recognizing and/or determining x and y intercepts
Graphing a linear equation using intercepts
Recognizing the slope of a line from its equation
Recognizing the slope of a line from the graph of a linear equation
Recognizing the slope-intercept form of a linear equation
Graphing a linear equation using the slope-intercept form
Graphing linear inequalities on the Cartesian coordinate system
Graphing absolute value linear equations on the Cartesian coordinate system
Graphing quadratic equations
Graphing quadratic inequalities
Graphing systems of linear equations
Graphing systems of linear inequalities

Solving Systems of Equations (9)

Recognizing systems of linear equations
Checking solution to systems of two linear equations
Solving systems of two linear equations by graphing
Solving systems of two linear equations by addition/elimination
Solving systems of two linear equations by substitution
Solving applications of systems of two linear equations
Solving systems of two linear inequalities
Solving systems of three linear equations
Solving systems of three linear inequalities

Quadratics (9)

Recognizing the zero factor property
Recognizing the standard form of a quadratic equation
Solving a quadratic equation in factored form
Solving a quadratic equation by factoring
Solving a quadratic equation by using the quadratic formula
Solving a quadratic equation by completing the square
Solving word problems involving quadratic equations
Graphing quadratic equations
Graphing quadratic inequalities

Rational Expressions (5)

Multiplying and dividing rational expressions
Finding the LCD of two or more rational expressions
Adding and subtracting rational expressions
Simplifying complex fractions
Solving equations involving rational expressions

Rational Exponents & Radicals (9)

Converting radicals to nth roots
Converting nth roots to radicals
Performing operations with rational exponents
Simplifying radicals
Adding and subtracting radical expressions
Multiplying and dividing radical expressions
Solving equations with radicals
Recognizing complex numbers
Simplifying expressions containing complex numbers

Geometry (7)

Applying the angle complement and supplement theorems
Applying the sum of the angles of a triangle theorem
Applying theorems on congruent angles formed when parallel lines are crossed by a transversal
Using the theorem on the proportionality of sides of similar triangles to find the length of a side of a triangle
Using the Pythagorean theorem to find the missing length of one side of a right triangle
Finding the perimeters and areas of squares, rectangles, parallelograms, trapezoids, triangles, circles, and other regions made from these geometric figures
Finding the volume of prisms, cylinders, pyramids, cones, spheres, and other solids made from these three-dimensional geometric figures

ESL Objectives

READING

Word Learning (26)

Dictionary Skills

- Alphabetizing — B
- Using guide words — I
- Syllabification: stress and other — I
- Selecting an appropriate definition for a word in context — I,A
- **Determining word meanings by recognizing affixes and roots:**
  - Inflectional — B
  - Derivational (changes parts of speech) — I,A
- Understanding compund words — B
- Understanding word entry information — I,A

Context Clues:

- Punctuation/typographical (e.g., italics, commas) — I,A
- Direct definition (e.g., *that is to say*) — B,I
- Experience (based on the reader's experience) — B,I,A
- Example — B,I
- Summary — I
- Comparison/contrast (e.g., *unlike Susan, who is...*) — I,A
- Appositives — I
- Synonyms and antonyms — B,I,A
- Figurative language and euphemisms — I,A
- Relative pronouns used in definition — A

Word Relationships

- Synonyms — B,I,A
- Antonyms — B,I,A
- Homonyms — B,I,A
- Function/word forms — B,I,A
- Cause/effect (e.g., *as a result*) — I,A
- Comparison/contrast (e.g., *as sweet as sugar*) — I,A
- Analogies (e.g., *quill is to pen as door is to...*) — I,A
- Idiomatic expressions — B,I,A

Literal Comprehension (20)

Sentence Level

- Word order as clues to meaning — B,I
- Paraphrase — I,A
- Connectors (e.g., *and, or, but, however*) — B,I
- **Transition Words as Clues to Meaning:**
  - Sequence/enumeration (e.g., *before, after*) — B,I
  - Cause/effect (e.g., *as a result*) — B,I,A
  - Comparison/contrast (e.g., *still, yet, also*) — I
  - Definition (e.g., *that is*) — I
  - Example (e.g., *such as*) — B,I
  - Summary (e.g., *to conclude*) — I
  - Problem/solution (i.e., conditional sentences) — I,A

Passage Level

- Previewing/predicting through skimming — I,A
- Distinguishing topic from main idea — I,A
- Distinguishing main idea from supporting details — B,I,A
- **Identifying types of support:**
  - Details — I,A
  - Examples — I,A
  - Facts — I,A
  - Reasons — I,A
  - Anecdotes — I,A
- Scanning for specific information — B,I,A
- Recognizing pronoun references — B,I,A

Critical (Interpretive) Comprehension (18)

- Recognizing analogies/association — I,A
- Categorizing — B,I,A
- Distinguishing between fact and opinion — I,A
- Distinguishing relevant from irrelevant information — I,A
- Making inferences — B,I,A
- Drawing conclusions — B,I,A
- Predicting outcomes — B,I,A
- Recognizing the author's point of view — I,A
- Recognizing biases and stereotypes — I,A
- Evaluating the credibility of the passage — A
- Determining the validity of the author's conclusion — A
- Determining the validity of the author — A
- Examining the quantity of evidence — I
- Examining the quality of evidence — A
- **Recognizing the author's purpose:**
  - Inform/explain — I,A
  - Persuade — I,A
  - Entertain — I,A
  - Appeal to the reader's emotion — I,A

Functional Skills (21)

Study Skills

- Following directions — B,I,A
- Outlining paragraphs — B,I
- Outlining passages — I,A
- Summarizing/synthesizing — I,A
- Notetaking — I,A
- Using memory & retention techniques — B,I,A
- **Test-taking:**
  - Multiple-choice questions — B
  - True/false questions — B
  - Matching questions — B
  - Completion questions — B
  - Cloze — B

Functional Reading Skills

- **Understanding:**
  - signs — B
  - forms — B,I
  - simple instructions — B
  - food and medicine labels — B
  - public transportation schedules — B
  - telephone directories — B
  - restaurant menus — B
  - training manuals — I
  - maps — B,I
  - charts/graphs — B,I

WRITING

Words/Phrases (51)

Nouns (Form & Function)

- Singular/plural (irregular nouns) — B,I
- Count/non-count nouns — I,A
- Collective nouns — I
- Noun phrases — B,I

B=Beginning I=Intermediate A=Advanced

- Possessive nouns (punctuation) I,A
- Gerunds I,A

Pronouns (Form & Function)
- Pronoun case B,I
- Demonstrative pronouns B
- Reflexive pronouns I,A
- Impersonal *You* A
- Relative pronouns A
- Extended subjects I

Verbs (Form & Function)
- Subject-verb agreement B,I
- To be B
- Other linking verbs I,A
- Intransitive verbs I,A
- Transitive verbs and object I,A
- Intransitive verbs and object and placement I,A
- Simple form B,I,A
- Progressive (present) B,I,A
- Progressive (past) I,A
- Progressive (future) I,A
- Perfect (present) I,A
- Perfect (past) A
- Perfect (future) A
- Perfect progressive (present) I,A
- Perfect progressive (past) A
- Perfect progressive (future) A
- Passive voice I,A
- Conditional (real and unreal) I,A
- Subjunctive A
- Causative I,A

Verb Modals (Form & Function)
- Simple modal auxiliaries or expressions B,I,A
- Compound modals A

Adjectives (Form & Function)
- Adjectives as modifiers (position and order) B,I,A
- Adjective case: comparative B,I,A
- Adjective case: superlative B,I,A
- Irregular adjectives B,I
- Articles B,I,A
- Determiners B,I

Adverbial Structures (Form & Function)
- Type B,I,A
- Position B,I,A
- Order B,I,A

Prepositions (Form & Function)
- Common prepositions in prepositional phrases B,I,A
- Verb plus prepositions (nonseparable) B,I,A
- Verb plus prepositions (separable) I,A
- Verb plus two prepositions I,A
- Idiomatic expressions B,I,A

Editing
- Using capitalization B,I
- Using correct spelling, suffixes, prefixes B,I,A
- Using conventions of Standard American English A

Sentences (41)

Writing Simple Sentences
- Affirmative/negative declarative sentences B
- **Interrogative sentences:**
  - Yes/no questions B,I
  - Informative questions (*who, what, when, where*) B
  - Informative questions (*which, whom, whose, why*) I
- Negative questions I,A
- Imperative sentences B
- Exclamatory sentences I

Writing Compound Sentences
- Using *and, or, but* B
- Using all other coordinators & adverbial connectors I,A
- Using transitions of sequence (puntuation & function) B,I,A
- Using all other transition words (punctuation & function) I,A

Writing Complex Sentences
- Using *while, before, because, after* B,I
- Using adverb clauses I
- Using adjective clauses I,A
- Using noun clauses A
- Using reported speech A
- Using embedded clauses A
- Using tag questions A
- Writing compound-complex sentences I,A

Using Appropriate Verb Sequencing
- In compound sentences I,A
- In complex sentences A
- In compound-complex sentences A

Identifying Syntactical Units
- Clauses I,A
- Fragments I,A
- Run-on sentences I,A
- Comma splices I,A

Writing Comparative Sentences
- Using adjectives B,I,A
- Using adverbs I,A
- Using nouns A

Using Sentence Variety and Sophistication
- Infinitives after verbs I,A
- Gerunds after verbs I,A
- Gerunds after prepositions I,A
- Verbals used as modifiers A

Proofreading and Editing
- Capitalization B,I
- **Punctuation:**
  - Serial comma B,I
  - Transition comma B,I,A
  - Compound sentence comma B,I
  - Appositive comma A
  - Compound sentence semicolon I,A
- Spelling B,I,A

Paragraphs (30)

Planning and Development
- Topic sentence B,I,A
- Topic & controlling idea in a topic sentence B,I,A
- Difference between topic and title B
- **Support:**
  - Major B,I,A
  - Minor I,A
- **Conclusion:**
  - Restatement of topic sentence B,I,A
  - Restatement of major support I
- Using organization appropriate to purpose B,I,A
- Using logical organization (outlining) B,I,A

B=Beginning I=Intermediate A=Advanced

Drafting

- Writing with clarity (unity) & coherence B,I,A
- Applying transition words according to function B,I,A
- Using sentence variety B,I,A
- Writing sentences with lexical sophistication A
- Using language appropriate to audience & purpose A

Rhetorical Modes

- Writing narrative with correct chronology B,I,A
- Writing description with correct spatial sequence B,I,A
- **Writing exposition:**
  - Using illustrations I,A
  - Using examples I,A
  - Using definition I,A
  - Using comparison/contrast I,A
  - Using classification I,A
  - Using cause/effect A
  - Using persuasion A
  - Using analysis A

Proofreading and Editing

- Organization B,I,A
- Content I,A
- Audience A
- Purpose A
- Tone A
- Mechanics B,I,A

Essays (13)

Planning and Development

- Multiparagraph composition with thesis statement A
- Distinguishing topic sentence from thesis statement A
- Finding & developing controlling idea of a thesis A
- Outlining the essay A

Drafting

- Using necessary paragraph style to produce an essay A
- Writing introductory paragraphs A
- Writing concluding paragraphs A

Proofreading and Editing

- Unity and coherence A
- Content A
- Audience A
- Purpose A
- Tone A
- Mechanics A

B=Beginning I=Intermediate A=Advanced

Study Skills/Critical Thinking Objectives

Personal Behaviors (35)

Goal Setting

- Understanding goal-setting
- Understanding commitment and perseverance
- Identifying personal goal plans (academic, financial, occupational)
- Discriminating among competing goals
- Developing timelines for short- and long range goals
- Finding resources needed for goal completion
- Evaluating goal accomplishment and modifying goals
- Developing personal rewards for goal achievement

Values Clarification

- Understanding value formation
- Knowing the characteristics of a value
- Understanding the impact of significant others on value formation
- Analyzing life experiences (family, social, spiritual)
- Recognizing value indicators
- Demonstrating knowledge of the process of values clarification
- Recognizing and resolving values conflicts

Self-Evaluation

- Understanding the benefits of self-evaluation
- Using personal strengths and other resources to enhance success
- Developing self-improvement plans
- Identifying additional competencies/skills needed for goal achievement
- Evaluating performance/improvement
- Understanding negative personal habits

Stress Management

- Understanding the need for adequate sleep, nutrition, and exercise
- Understanding the nature and effects of stressors
- Analyzing current stressors
- Comprehending appropriate and inappropriate stress-reduction techniques
- Developing a stress-management plan
- Evaluating stress-management skills

Time Management

- Comprehending time priorities
- Determining the time needed for each priority
- Understanding principles of scheduling
- Knowing techniques for saving time
- Understanding time-wasters and how to correct them
- Developing and evaluating long- and short-term schedules
- Practicing time-management techniques
- Establishing priorities in a daily "to-do" list

Study Behaviors (15)

Concentration/Memory

- Creating the appropriate study environment
- **Developing the ability to concentrate:**
  - Identifying external distractions/interference
  - Identifying internal distractions/interference
  - Applying concentration techniques
  - Recognizing short-term memory
  - Recognizing long-term memory
  - Introducing effective memory techniques/strategies (e.g., outlining, using the peg system, chunking/clustering)
  - Applying appropriate memory techniques to differing tasks

Textbook Learning

Understanding textbook study methods (e.g., SQ3R, marginal questions)

Applying textbook study techniques (e.g., surveying, constructing topical maps, highlighting, using study questions & glossaries)

Reference Skills

Knowing how to use reference materials such as the dictionary, the library, computers

Test Preparation

Organizing resources such as notes, outlines, and summaries

Analyzing review procedures (e.g., specialized terms, ideas emphasized in the text, lectures, supplementary readings)

Using resources for test preparation (e.g., previous tests, study guides, handouts, group study)

Developing personal study materials (e.g., two-way charts, flashcards, questions, mapping, information integrated from several sources)

Classroom Behaviors (26)

Listening

Applying effective listening techniques:

- Resisting distractions, staying focused, exhibiting alertness
- Finding areas of interest
- Judging content, not delivery only
- Distinguishing essential from elaborative material
- Understanding the presenter's principle of organization

Note-Taking

Knowing the purposes of note-taking

Understanding tips for note-taking (e.g., personal shorthand, discipline specific techniques, consistency of style, signal words & phrases)

Understanding note-taking techniques (e.g./, topic/explanation or idea)

Applying note-taking techniques

Combining notes from a variety of sources (text, lecture, collateral reading, worksheets, study guides)

Test-Taking

Applying general test-taking principles:

- Preparing physically and psychologically
- Previewing the test
- Understanding the directions
- Budgeting time
- Having adequate supplies

Applying skills for objective tests:

- Multiple-choice
- True/false
- Matching
- Completion

Applying skills for objective tests:

- Short answer
- Essay

Applying techniques for improving test performance:

- Reviewing exams/tests
- Diagnosing performance
- Developing a plan for improvement
- Evaluating results
- Managing test anxiety

Critical Thinking (39)

Affective Strategies

Fostering independent thinking

Exercising fairmindedness/suspending judgment

Developing confidence in reason

Developing interpersonal skills for collaborative thinking

Developing intellectual perseverance

Thinking precisely about thinking

Becoming aware of one's own thinking process (metacognition) in order to monitor and direct it

Fundamentals of Thinking

Understanding the vocabulary of critical thinking

Distinguishing facts from opinions

Distinguishing facts from values

Distinguishing relevant from irrelevant facts

Evaluating evidence and alleged facts

Recognizing stated assumptions

Recognizing unstated assumptions

Evaluating stated and unstated assumptions

Recognizing and evaluating causal relationships

Recognizing and evaluating analogies

Noting significant similarities and differences

Recognizing contradictions

Recognizing implications and consequences

Distinguishing deductive and inductive reasoning

Identifying logical fallacies

Making plausible inferences, predictions, interpretations

Making justifiable generalizations

Understanding the significance of criteria for evaluation

Evaluating the credibility of sources of information

Understanding vagueness and ambiguity

Clarifying contextual meanings of words and phrases

Thinking Strategies

Raising and pursuing root or significant questions

Exploring issues from multiple perspectives, including one's own

Analyzing or evaluating arguments, interpretations, beliefs, or theories

Analyzing or evaluating actions or policies

Understanding problem-solving processes

Assessing problem-solving processes

Understanding decision-making processes

Assessing decision-making processes

Making interdisciplinary connections

Understanding strategies for generating new ideas

Applying knowledge/insights to various contexts or different circumstances

Appendix C

Software Publishers*

Academic Success Press
Post Office Box 25002, #132
Bradenton, FL 34206

Addison Wesley Publishing Company, Inc.
Consumer Software Support
Jacob Way
Reading, MA 01867
(617) 944-3700

All-Write
32 Doonan Street
Medford, MA 02155
(617) 395-4608

American Language Academy
1401 Rockville Pike, Suite 550
Rockville, MD 20852
(800) 346-3469

BLS
5153 West Woodmill Drive Suite 18
Wilmington, DE 19808
(800) 545-7766

Britannica Software
345 Fourth Street
San Francisco, CA 94107

Brooks and Cole
511 Forest Lodge Road
Pacific Grove, CA 93950-5098
(408) 373-0728
(800) 354-0092

Brown Bag Software
2105 South Bascom Avenue
Campbell, CA 95121
(408) 559-4545

Bureau of Business Practices
24 Rope Ferry Road
Waterford, CT 06386
(204) 442-4365

C & D Computer Enterprises, Inc.
720 Midwest Club Parkway
Oak Brook, IL 60521
(708) 653-3555

Compris
1 Faneuil Hall Market Place
Boston, MA 02109
(617) 742-7235
FAX: (617) 742-3431

Conduit
The University of Iowa Oakdale Campus
Iowa City, IA 52242
(319) 335-4100
(800) 365-9774

D.C. Heath and Company
125 Spring Street
Lexington, MA 02173
(617) 862-6650
(800) 235-3565

Daedalus Group, Inc.
1106 Clayton Lane 448E
Austin, TX 78723
(512) 459-0637
(800) 879-2144

Davidson & Associates
19840 Pioneer Avenue
Torrance, CA 90503
(310) 793-0600
(800) 556-6141

Degem Systems, Ltd.
6220 S. Orange Blossom Trail - Suite 316
Orlando, FL 32809
(407) 859-8525
(800) 237-3838

EDL
P.O. Box 210726
Columbia, SC 29221
(800) 227-1606

Educational Activities, Inc.
Post Office Box 392
Freeport, NY 11520
(516) 223-4666
(800) 645-3739
FAX: (516) 623-9282

Educational Design, Inc.
345 Hudson Street
New York, NY 10014
(800) 221-9372

Educational Testing Service
Rosedale Road
Princeton, NJ 08541
(609) 921-9000

Educulture
689 West Schapvill
Scales Mound, IL 61075
(815) 777-9697
(800) 553-4858

FinnTrade Inc.
2000 Powell Street, Suite 1200
Emeryville, CA 94608
(510) 547-2281

Fox Valley Technical College
1825 N. Bluemound Drive
Appleton, WI 54913-2277
(414) 735-5683

Harpercolling
1900 East Lake Avenue
Glenview, IL 60025

H & H Publishers
1231 Kapp Drive
Clearwater, FL 34625
(813) 442-7760
(800) 366-4079
FAX: (813) 442-2195

H & N Software
P.O. Box 4067
Bricktown, NJ 08723
(718) 482-5715

Harcourt Brace & Company
7555 Caldwell Avenue
Niles, IL 60714
(800) 237-2665

Harper Collins Publisher
1000 Keystone Inductrial Park
Scranton, PA 18512
(800) 242-7737

Hartley Courseware
133 Bridge Street
Dimondale, MI 48821
(517) 646-6458
(800) 247-1380

Houghton Mifflin
222 Berkely Steeet
Boston, MA 02116
(617) 351-5000

IBM
P.O. Box 1328-W
Boca Raton, FL 33432
(800) 426-3333

ICD Corporation
319 N. Freedom Boulevard
Provo, UT 84601
(801) 373-3233
(800) 658-8567

*Information current as of July 1993

Indiana University Learning Skills Center
316 North Jordan Avenue
Bloomington, IN 47405
(812) 855-4848

Instructional/Communications Technology
10 Stepar Place
Huntington Station, NY 11746
(516) 549-3000
(800) 225-5428

Jostens Learning
931 Village Boulevard, 907
Box 290
West Palm Beach, FL 33409
(407) 478-4001
(800) 221-7927

Kapstrom, Inc.
P.O. Box 1230
Buda, TX 78610
(512) 295-4095

Krell Software, Corp.
Post Office Box 1252
Lake Grove, NY 11755
(800) 245-7355

LEEP, Inc.
1475 Holburne Road
Mississauga, Ontario
Canada L5E 2L5
(416) 271-7504

Lexpertise Linguistic Software
380 S. State Street - Suite 202
Salt Lake City, UT 84111

Logicus Incorporated
908 Niagara Boulevard (Suite 292)
N. Tonawanda, NY 14120-2060

Lotus WPO
1000 Aberwathy Road
Building 400, Suite 1700
Atlanta, GA 30328

The Math Lab
10893 Leaveslev Place
Cupertino, CA 95014
(408) 265-5659

Maxthink Assoc.
2425B Channing Way, #592
Berkley, CA 94704
(415) 540-5508

Ment Audio Visual
Post Office Box 132W
New York, NY 10011
(800) 753-6488

MCE Lawrence Production
1800 S. 35 Street
Post Office Box 458
Galesburg, MI 49053
(616) 665-7075
(800) 421-4157

McGraw-Hill
3017 E. Washington
Iowa City, IA 52245
(319) 351-6329

MCP
Micro Computer Project
2604 Waintu Street
Cedar Falls, IA 50613-3593
(800) 552-6227

MECC
6160 Summit Drive North
Minneapolis, MN 55430-4003
(612) 569-1500
(800) 685-6322

Milliken Publishing Co.
1100 Research Blvd
St. Louis, MO 63132-0579
(800) 643-0008

Pacific Crest Software
875 NW Grant Avenue
Corvalis, OR 97330
(503) 754-1067

Parlance Software
542 South Yorktown
Tulsa, OK 74104
(800) 765-6654

Professor Weissman's Software
246 Crafton Avenue
Staten Island, NY 10314
(718) 698-5219

Projected Learning Programs, Inc.
P.O. Box 3008
Paradise, CA 95967-3008
(800) 248-0757

Que Software
11711 N. College Avenue
Carmel, IN 46032
(800) 428-5331

Queue, Inc.
338 Commerce Drive
Fairfield, CT 06430
(203) 335-0906
(800) 232-2224
FAX: (203) 336-2481

Research Design Associates, Inc.
10 Blvd. Avenue
Greenlawn, NY 11740
(800) 654-8715

Saunders College Publishing
Public Ledger Building
620 Chestnut Street, Suite 560
Philadelphia, PA 19106
(215) 238-5500

Scholastic, Inc.
730 Broadway
New York, NY 10003
(800) 541-5513

Simon & Schuster
200 Old Tappan Road
Old Tappan, NJ 07675
(800) 223-2348

Skills Bank Corporation
15 Governor's Court
Baltimore, MD 21244
(800) 451-5726

Soft Warehouse, Inc.
3660 Waialae Avenue - Suite 304
Honolulu, HI 96816
(808) 734-5801

SRA Thinkware Products
Post Office Box 543
Blacklick, OH 43004
(800) 621-0476

Sunburst Communications
39 Washington Avenue
Pleasantville, NY 10570
(800) 628-8897

TASL
Box 8202 North Carolina State University
Raleigh, NC 27695-8202
(800) 955-8275

Timeworks, Inc.
625 Academy Drive
North Brook, IL 60062
(708) 559-1300

Tom Snyder Productions
80 Coolridge Hill Road
Watertown, MA 02172
(617) 926-6000
(800) 342-0236

Townsend Press
Pavilions at Greentree
Marlton, NJ 08053
(609) 772-6410
(800) 772-6410

True Basic, Inc.
12 Commerce Avenue
West Lebanon, NH 03784
(800) 872-2742

Tusoft
P.O. Box 9979
Berkeley, CA 94709

Ventura Educational Systems
910 Ramona Avenue, Suite E
Grover Beach, CA 93433
(800) 336-1022

VTAE
2564 Branch Street
Middleton, WI 53562
(608) 831-6313
(800) 821-6313

W. W. Norton and Company, Inc.
500 Fifth Avenue
New York, NY 10110
(212) 354-5500
(800) 233-4830

Wadsworth Publishing Company
7625 Empire Drive
Florence, KY 41042
(800) 423-0563

Weaver Instructional Systems
6161 28 St. S.E.
Grand Rapids, MI 49546
(800) 634-8916

WICAT Systems
1875 South State Street
Orem, UT 84058
(800) 759-4228

William C. Brown Communications
2460 Kerper Boulevard
Dubuque, IA 52001
(800) 338-5578

Wisc-Ware
1210 West Dayton Street
Madison, WI 53706
(800) 543-3201

Wordperfect Corporation
1555 N. Technology Way
Orem, UT 84057
(800) 321-4566

Writing Tools Group
201 Alameda del Prado
Novato, CA 94949
(415) 382-8000

Xpercom
4939 Lahoma Street
Dallas, TX 75235
(214) 521-4333

Applications Software Descriptions

Computerized Placement Tests
distributed by

The College Board
P.O. BOX 6800
Princeton, NJ 08541-6800
(609) 734-5782 or (215) 750-8410

Being Used at North/Wolfson Campuses

Computerized Placement Tests (CPT's) represent an assessment program based on computerized adaptive testing techniques. This methodology customizes tests according to each student's abilities, presenting a student with a series of test questions at the appropriate level of difficulty for his or her abilities, knowledge, and background. Questions that are either too difficult or too easy are avoided, and accurate results are obtained with fewer questions administered with no time limit. These tests greatly benefit students in institutions where developmental courses are available.

The CPT's are untimed and require little proctor intervention. They include Reading Comprehension, Sentence Skills, Arithmetic Skills, Elementary Algebra, and College-Level Mathematics. Each test has from 12 to 20 questions selected from a pool of 100 questions and usually takes about 15 to 20 minutes to complete. A typical student takes from three to four tests and spends a total of 90 to 100 minutes on them. About half of this time is used by the student to comlete the sign-on procedure, answer the background questions, go through the familiarization screens, and take the two verbal tests (Reading Comprehension and Sentence Skills). The remainder of the time is usually spent on the mathematics tests. The tests that are administered to students are determined solely by the institution. Initial questions are selected randomly from those of average difficulty. Subsequent questions are selected automatically based on the answers to the prior question(s). Students' scores depend on the difficulty of the questions they answer correctly.

Realtime Writer
distributed by

Realtime Learning Systems, Inc.
2700 Connecticut Avenue, N.W.
Washington, D.C. 20008
(202) 483-1510 or (800) 832-2472

Being Used at North/Wolfson Campuses

Realtime Writer is a tool for interactive group learning in a computerized classroom environment.

It is quite simple in concept. Students sit at a series of interconnected computers and communicate with each other by typing on the keyboards of their individual computers and reading their computer screens. The communication is live — it occurs in real time.

In its simplest use, the software controlling the computers divides the screen of each monitor into two rectangular areas called windows. A student types a message in a private (lower) window dedicated to serving just that one student. When satisfied with the message, the student presses a key to send it to the public (upper) window that appears instantly on other students' screens. There, in a scrolling dialogue, it joins messages other students have sent.

As in all classrooms, the use of this unique software is dependent on the goals, the skills, and the ingenuity of the teacher. Participation is readily available to all students, who seem to enjoy using the system and are engaged by it.

Rather than having all students talk at once on the same channel, during most sessions involving more than a handful of students, students will typically be placed into small groups and will communicate within their group on a single channel.

It is important to realize that teachers exercise decision-making in initiating discussions, and to an extent they can control the direction of that discourse. But there is also a dynamic at work with this system which makes this classroom setting very democratic. This occurs because students, as well as the teacher, can control the direction of their conversations. This is a process which can cause discomfort for some teachers.

Functions are provided for teacher-managed course material presentation, for recording and printing of class conversations, and for managing class rosters.

PLATO
distributed by

The Roach Organization, Inc.
2607 Oberlin Road, Suite 100
Raleigh, NC 27608
(800) 869-2000

Being Used at North Campus

The **PLATO** curriculum meets student needs from remediation to mainstream to enrichment. Because of its flexible design, the PLATO curriculum can assist faculty in the often complex planning required for effective competency-based individualized instruction.

The lessons are sequentially designed to reinforce skills previously learned, yet each lesson retains the ability to stand alone. This unique modularity allows faculty to design individual programs according to each student's needs.

The Basic Literacy program (3 - 8 grade level skills) in PLATO consists of 258 lessons in reading, 139 in writing, and 192 in mathematics. The Advanced Literacy program (9 - 12 grade level skills) consists of 82 lessons in reading, 87 in writing, and 263 in mathematics.

The PLATO Curriculum Manager allows faculty to collect information on the status of students. Reports that show the progress of students, how many times they have worked with a particular lesson, etc. can be printed. In addition, instructors can display all of the main modules or *Routing Activities* set up in the system to see what lessons are offered.

A Routing Activity is made up of a collection of lessons and tests. When students are registered in a course, they can be assigned to a given routing activity. When students sign on, they will be presented with a menu of options that will guide them through the lessons assigned to them.

CSR
distributed by

Computer Systems Research, Inc.
Avon Park South
P.O. BOX 45
Avon, CT 06001
(609) 387-7121
(800) 922-1190

Being Used at North/Wolfson Campuses

CSR's Integrated Learning System (ILS) consists of curriculum software and the associated management components. The CSR Basic Skills offerings include more than 400 courses (modules) which teach individual reading, writing, and math skills. The modules are organized into five levels, Level V representing college-level skills.

Each CSR module begins with a pre-test. If students pass the pre-test, they are immediately referred to the next module on the list. If students fail the pre-test, they are led into a tutorial which offers an explanation of the topic and guides them through a number of step-by-step examples. The examples are followed by a series of practice exercises in which the student is asked to furnish correct responses. Incorrect responses are met with helpful hints and suggestions. Once the practice exercises have been completed, students are given a post-test. If they pass it, they are ushered to the next module. If they fail the post-test, they are led through the same tutorial a second time. Regardless of whether the student passes or fails the post-test the second time, the student is moved to the next module. Only after all of the modules in the segment have

been completed is the student allowed to go through the failed module(s) a third and final time. All of the courses are presented in color.

CSR's management components assist the faculty in designing and delivering predetermined sequence of modules to their students, keep track of the students' time on task and progress, and provide reports on individual students as well as for the class.

QUANTUM/READING STRATEGIES

distributed by

EDL

P. O. Box 210726
Columbia, SC 29221
(800) 227-1606

Being Used at Wolfson Campus

The **Quantum Reading Series** and the **Reading Strategies** are reading-enrichment programs that use high-interest stories to assist students in building rapid fluency in reading. Both programs build fluency while reinforcing vocabulary and comprehension skills. They include computerized tachistoscopic exercises to develop perceptual accuracy by flashing words faster or slower according to the student's responses, so a challenging rate can be constantly maintained. The fluency training has built-in checks which allow students to adjust the presentation rate within a story or from one story to another. Literal and interpretive comprehension checks are used to assess the recommended reading rate of the next story for the students.

Students sign on by entering their student ID at the ICLAS prompt and selecting the EDL software they wish to use. Students are allowed to repeat lessons and can exit at any time except through a vocabulary lesson, in which case they have to complete the initial test to assess their understanding.

The Quantum Reading Series covers five grade levels ranging from 10.5 through 13.5. The Reading Strategies series contains nine grade reading levels spanning from grade 1.0 through 10.5. Each grade level in both software packages can be run independently with EDL's management system.

The EDL management system keeps a record of students' activities that can be printed or displayed by the faculty in monitoring and advising students on their progress.

WRITER'S HELPER STAGE II

Being Used at Wolfson Campus

Writer's Helper Stage II is a prewriting, writing, and revising package which works with other word processors to teach the writing process. It offers ninteen prewriting and twenty revision activities ranging from routine approaches to writing innovative analyses. The prewriting tools include Find, Explore, and Organize, while revising tools include Structure, Audience, and Checks.

Writer's Helper Stage II assists students in finding an appropriate topic, provides a method of brainstorming through word-association lists, and offers several techniques in paragraph development. The faculty are allowed to modify, create, and update any of the lists to suit particular topics and individual teaching styles. Students are also allowed to export their writing to a word processor of their choice where they can continue making changes to their essays.

EdLAN

Being Used at Wolfson Campus

In addition to these programs, the Academic DESKlab also comes with EdLAN: IBM Education LAN and Tools that include the following software: IBM Link Way, Microsoft Works, LANSchool, Excelsior Grade, Excelsior Quiz, and Express Publisher.

MICROSOFT WORKS

Must of the faculty members in writing started using **Microsoft Works** right away with their students since they are already familiar with

word-processing programs. Students also adapted to the program quite well with only a few exceptions. During class, students wrote, revised, and printed their essays in Microsoft Works; their proficiency in using the software improved greatly during the rest of the semester. However, there were times when some students had problems logging, writing to, or finding their files to continue with a particular writing assignment; nonetheless, most of them preferred to use the computer for their writing.

LANSchool

LANSchool is another interesting software that most of the faculty found intriguing and started using creatively. LANSchool allows the faculty member to broadcast computer screens to connected workstations and project an on-screen pointer for easy instruction. The faculty can take "control" of a student's keyboard at any time and can return this control back to the student when a required response has been given. This feature greatly facilitates a personalized system of instruction even in a networked environment. The faculty member can choose students one at a time to work with or can have the entire class log into LANSchool. The faculty member can also "watch" students' computer screens without the students' knowing that they are being watched and can send information back to the students about what they are doing right or wrong.

As the faculty have become familiar with Desklab, they have starting using **Excelsior Grade** to manage their student information and data. In addition to grade management, the Excelsior Grade also includes a program for creating student databases, test scanning, analysis and report generation. Some of the faculty are already looking at how to use Excelsior Quiz to create tests. The faculty are yet to be introduced to **Express Publisher**, a personal desktop-publishing program.

MATHCUE SOFTWARE

distributed by
Saunders College Publishing
The Public Building
620 Chestnut Street (Suite 560)
Philadelphia, PA 19106

Being Used at North Campus

MathCue is an interactive software package developed by George W. Bergeman to support the text, *Fundamentals of Mathematics* (5th ed. by Baker, Rogers and Van Dyke). Practice questions are presented to students section by section with annotated solutions. Students use the software to practice and test their skills and to pinpoint and correct weak areas. In addition to this, the textbook also comes with another software package, *MathCue Solution Finder*, which lets students ask questions, and where appropriate, the software will display results and the necessary steps involved in obtaining the solution. Students may choose to see the solution to problems answered correctly and to view partial solutions if they need help beginning a problem. The program also refers students to specific sections of the text for assistance. The software helps students in solving homework problems, reviewing, and exploring basic concepts.

Students can select which chapter to work on, if they need a review before working on practice problems for a particular chapter. A record of the student's activity is kept and can be printed out at the end of the session. A student's record includes number of problems worked and number answered correctly or incorrectly.

Faculty's weekly reports from ICLAS contain the amount of time each student spent on the software. Thus, the faculty can determine how much students have accomplished by using both the student printout and the ICLAS weekly report.

Description of the SYNERGY Centers
North Campus
Hardware/Software Configuration

HARDWARE

Server-1
- IBM PS/2 Model 80-311
  - 8 Mb memory
  - 2 300 Mb hard disks
  - 1.44" floppy drive
  - Internal Tape Back-up
  - Mouse
  - 8513 Monitor

WorkStations-24
- IBM PS/2 Model 30-286
  - 2 Mb Memory
  - 30 Mb hard disk
  - 1.44" floppy drive
  - Mouse
  - 8513 Monitor

Printers-6
- 1 IBM Proprinter III XL
  - Connected to server
- 5 Proprinter XL
  - Connected to Workstations
  - (Software configures them as network printers)

SOFTWARE

Operating Systems
- DOS 4.0
- Novell Netware 2.15
- ICLAS-IBM Classroom LAN Administration System
- Windows 3.0 on Workstations running under ICLAS.

Operations

When each workstation is booted a batch file allows the option to go to PLATO or ICLAS.

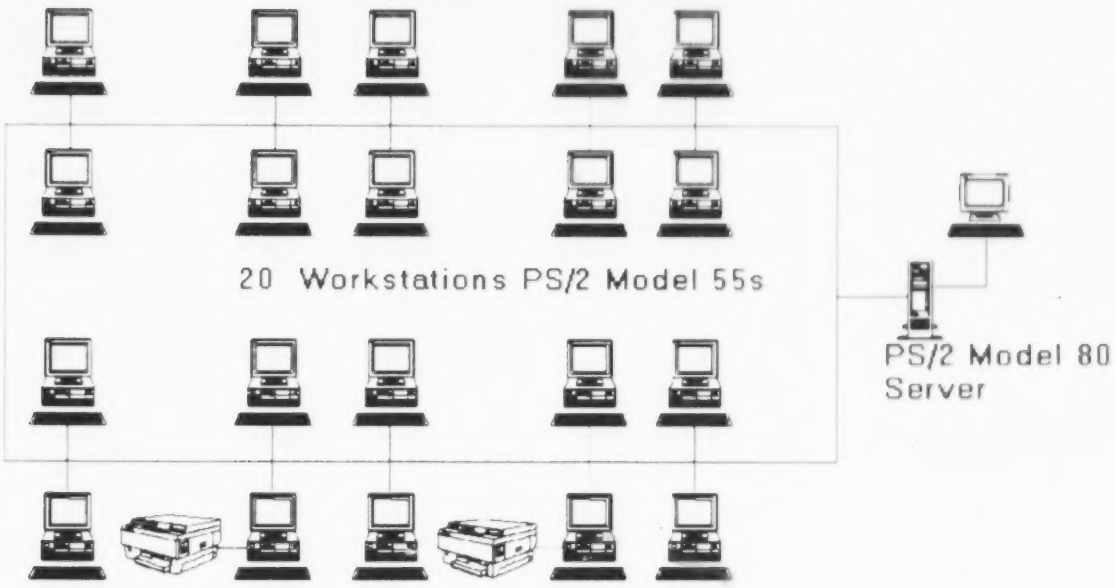
If PLATO is chosen then the workstation can runs the software:
- PLATO

If ICLAS is chosen , then the following software are available under ICLAS:
- Realtime Writer
- CSR
- WordPerfect 5.1
- Write under Windows 3.0

Recommended Modifications: 2 laser printers rather than the 5 dot matrix printers. 1 dedicated administrative workstation with the internal tape drive. This means at least a Model 50 PS/2.

Wolfson Campus Academic DESKlab

Hardware/Software Configuration



HARDWARE

Server-1
- IBM PS/2 8580 Model A31
  - 12 Mb memory
  - 320 Mb hard disks
  - 1.44" floppy drive
  - 120 Mb Internal Tape Drive
  - Token Ring Card
  - 8515 Monitor
  - Mouse

WorkStations-20
- IBM PS/2 8555 Model 041
  - 4 Mb Memory
  - 40 Mb hard disk
  - 1.44" floppy drive
  - Token Ring Card
  - 8515 Monitor
  - Mouse

Printers-2
- 2 IBM 4019-E01 Laser Printers
  - Connected to Workstations
  - (Software configures them as network printers)

SOFTWARE

Operating Systems
- DOS 5.0
- Novell Netware 2.15
- ICLAS-IBM Classroom LAN Administration System

Pre-Loaded Software
- Accuplacer
  - CPT-Computerized Placement Tests
  - CPMS-Computerized Placement Management System
- CSR Language Arts Program Level IV
- CSR Mathematics Program Level IV
- EdLAN: IBM Education LAN Tools
  - Excelsior Grade/Quiz Version 1.1
  - Express Publisher Version 1.1
  - IBM Linkway version 2.0
  - LANSchool Version 3.01
  - Microsoft Works Version 2.00a
- Writer's Helper Stage II

Additional Software
- CSR Language Arts Program Level V
- CSR Mathematics Program Level V
- EDL's Quantum Reading Series Levels J-M
- EDL's Reading Strategies Series Levels AA-IA
- Realtime Writer

Project SYNERGY Resources

PS^3 — Project SYNERGY Software Selector Program:
Reading • Writing • Math • ESL • Study Skills/Critical Thinking

Individual License	$100
Site License	$150
Annual Fee for Upgrades	$100

***Software Implementation Model* — 45-Minute Video**

Each Video	$45

***Integrating Teaching and Technology* — 30-Minute Video**

Each Video	$45

Project SYNERGY *Year Three Report*

Each Report	$10

NOTE: Prices include shipping & handling by regular mail in the U.S. and Canada.

Make checks payable to Miami-Dade Community College and mail to:

Miami-Dade Community College
Product Development and Distribution
11011 SW 104 Street
Miami, FL 33176

Please feel free to call Kamala Anandam (305-237-2540) if you are interested in:

- Incorporating Project SYNERGY principles and strategies at your institution.
- Having us conduct faculty workshops.
- Sharing with us the results of your research efforts.
- Applying for grants to become an adoption site for Project SYNERGY Integrator.
- Converting your software to be compatible with Project SYNERGY Integrator.

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